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## ORIGINAL ARTICLES

### SPLENECTOMY IN THROMBOPENIC PURPURA HEMORRHAGICA\*

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THROMBOPENIC purpura hemorrhagica is a descriptive name used to designate a group of the purpuric diseases in which pathological bleeding is associated with a marked reduction in the number of blood platelets or thrombocytes. This group includes two forms of purpura, one in which the thrombopenia is constitutional or primary and another in which it is symptomatic or secondary to some diseased condition as sepsis, nephritis, drug poisoning, the infectious diseases, leukemia, and diseases of the liver. The primary form is supposed to represent a disease entity although some observers do not concede that either form is a real disease and maintain, with some reason, that all purpura is merely a symptom complex.

Before the importance of the platelets in this group of purpuras was fully recognized, primary thrombopenic purpura was called Werlhof's disease or idiopathic purpura hemorrhagica. In this article for the sake of brevity the less accurate but shorter name purpura hemorrhagica will be used at times in referring to this form of purpura.

Primary purpura hemorrhagica occurs in an acute or chronic form. The chronic form, either continuous or intermittent in type is by far the more frequent and is usually observed in females under thirty years of age. The first manifestations of the disease often appear in childhood and recur at intervals over a long period. Unless there is a fatal termination the disease eventually ends in spontaneous recovery.

The clinical picture of this disease is clearly defined and easily recognized by purpuric spots in the skin, hemorrhages from the mucous membranes, a tendency to bleed excessively from cuts or into traumatized tissue, and a blood examination that shows these typical features. The platelets are practically absent or greatly diminished in number, there is a normal or high normal coagulation time, and the blood clot is non-retractile. The normal bleeding time of three minutes is prolonged to thirty minutes or even

an hour and the tourniquet or capillary resistance test is positive.\*

The purpuric spots in this disease vary in size from small petechiae to large ecchymoses. They are most often seen on the arms and legs but may appear in the mucous membrane of the mouth or in the skin of any part of the body.

External hemorrhages occur most frequently from the nose, the gums, and the uterus, less frequently from the genito-urinary tract and the stomach and intestine. Occasionally hemorrhages take place in the retina of the eye and in the meninges or into the substance of the brain where their importance depends upon the location rather than the amount of the bleeding.

In purpura hemorrhagica there is a definite hemorrhagic diathesis. During an active stage of the disease these patients are potentially bleeders. They bruise easily and bleed excessively from wounds. After operations the bleeding may be as persistent as in a hemophilic. The tissues about the incision become widely diffused with blood and in spite of abundant clot formation there is a constant trickle of blood from beneath the clot. This is quite different from the bleeding observed in hemophilia under similar conditions where there is a minimum of clot formation and a continuous flow of thin watery blood from the wound.

Formerly purpuric bleeding was treated, rather ineffectively, by local measures, internal medication and blood transfusions. It is characteristic of thrombopenic purpura that the course of the disease is marked by exacerbations during which the tendency to hemorrhage is increased.

In a mild form of the disease the bleeding often stops spontaneously. In a more severe form these measures of treatment may tide the patient over an acute attack but in really severe cases even blood transfusion, the most effective of these measures, has but a temporary effect. The first transfusion may check the bleeding for two

\*The bleeding time is the time that elapses until the bleeding from the prick of a needle stops spontaneously. The tourniquet test is made by applying a tourniquet about the upper arm just tight enough to shut off the venous return. When the test is positive petechiae appear in the skin below the level of the tourniquet.

\*Read at the meeting of the American Surgical Association, May 5, 1925, Washington, D. C.

or three days but they seem to lose effectiveness with each repetition. Some writers even maintain that the bleeding is increased by transfusion.

This was the situation in regard to treatment until 1916 when Kaznelson<sup>1</sup> first advocated removal of the spleen in purpura hemorrhagica and applied it in one of his own cases with such striking results that the procedure was widely adopted. In 1924 Engel<sup>2</sup> reviewed 20 cases that had been reported in the German literature, including Kaznelson's series of five cases and added reports of four of his own cases. During the past two or three years the spleen has been removed in this disease with increasing frequency, especially in this country. At the present time the total number of reported cases is about forty-five (3, 4, 5, 6, 7, 8, 9, 10). To this number the writer adds five cases from the Clinic of the Massachusetts General Hospital operated upon within the last twelve months.

In the majority of these reported cases the splenectomy is of too recent date to justify definite conclusions as to the permanency of the late results but they do show the immediate effect of the removal of the spleen in purpura hemorrhagica and the early results of this method of treatment.

It is not feasible to consider, at this time, the pathogenesis or the causes of bleeding in purpura hemorrhagica. Suffice it to say that most observers believe the bleeding to be dependent on two factors, lack of normal platelets and changes in the blood vessels. A full discussion of this phase of the subject can be found in the publications of Frank, Kaznelson, Brill and Rosenthal, and Cohn and Lemann. In this short article attention will be focused on the use and the value of splenectomy in this disease.

#### SUMMARY OF CASE REPORTS

The five cases reported in detail at the end of this paper include four typical cases of primary thrombopenic purpura hemorrhagica and a fifth which proved to be one of secondary thrombopenic purpura associated with cirrhosis of the liver. There were no fatalities in this group. The effect of splenectomy was prompt and favorable and confirmed in every way the reports of the immediate benefits that have been obtained by removal of the spleen in this disease; which are, cessations of bleeding, a rapid increase in the number of platelets with the return of the bleeding time and clot retraction to normal limits.

In Case I the result was typical for this type. The patient, a woman of 28 years had had chronic continuous purpura hemorrhagica since the age of 11 and was incapacitated by excessive menorrhagia. At times the flow was continuous for six weeks. The first period after splenectomy was normal in every respect and all subse-

quent periods have been the same up to the present time, a year after the operation.

In Cases II, III, and IV the spleen was removed during the acute stage of active uncontrollable bleeding. The bleeding stopped after splenectomy in all three cases and had not recurred up to the last observation with the exception of Case II in which the patient reported two nose bleeds of small amount that stopped without treatment.

In Case V splenectomy was advised on the assumption that primary thrombopenic purpura hemorrhagica was the correct diagnosis although the patient was a woman of 64 years and the disease is very uncommon at this age. The purpuric signs were petechiae in the skin, epistaxis and finally melena of large amount. At operation a small cirrhotic liver was found with a very adherent spleen, the removal of which was accompanied by bleeding that required immediate transfusion. The convalescence was slow in this case but the signs of purpura disappeared with the operation. At the last report (9 months) the general condition was much improved and the patient had gained 15 pounds in weight. A blood report could not be obtained. The bleeding from the intestinal tract in this patient was probably of the type usually observed in cirrhosis of the liver augmented by a purpuric hemorrhagic tendency. The improvement in general condition which followed splenectomy should, in a large measure, be ascribed to the benefit which may be obtained by removal of the spleen in cirrhosis of the liver. The bleeding tendency has apparently been corrected and the combined result would seem to justify the operation of considerable risk which was undertaken in this case.

Cases I, II, III and IV were last examined respectively eleven months, fourteen months, eleven months and four months after operation. All the patients had gained weight and were in normal health with the exception of one patient, Case II, who was under treatment for chronic arthritis. None of the patients reported abnormal bleeding or the occurrence of petechiae. The platelet count was normal or slightly diminished in case I. In the other three cases the platelets were definitely increased, in Case II there was a very great increase, the platelets being four or five times the normal number. In all four cases large forms were frequently seen. The clot retraction, bleeding time and the tourniquet test were normal in every case.

#### INDICATIONS FOR SPLENECTOMY

Abnormal bleeding is the essential feature of purpura hemorrhagica and the gravity of each case depends upon the amount, the persistence, and at times the location of the hemorrhage. The value of any method of treatment in this disease is measured by its effectiveness in controlling



hemorrhage and splenectomy apparently stands first in this respect.

Splenectomy is indicated, as an emergency measure, when the bleeding is excessive and cannot be checked by rest, internal therapy, local applications, radiation of the spleen, or transfusion. It is the procedure of choice in the chronic form of purpura hemorrhagica in which persistent bleeding and secondary anaemia incapacitate the patient. The results of splenectomy have been so favorable under these circumstances that the indications for the operation will probably be extended to include even milder forms of the disease with recurring attacks of moderate bleeding that signify a persistent hemorrhagic tendency. Unless this tendency is corrected by removal of the spleen the disease may last for years. Such patients are not very sick but there is always the disturbing possibility of serious bleeding from wounds or hemorrhages that are dangerous on account of their location. It is not uncommon in this disease to observe signs of bleeding into the cerebro-spinal system. This blood is usually absorbed without serious after effect but in some cases such hemorrhages have been the cause of a sudden fatality. Longcope<sup>11</sup> has reviewed this phase of the subject and cites four cases illustrating this complication and Sternberg<sup>12</sup> and Pla<sup>13</sup> also report unoperated cases in which a fatal result was proved at autopsy to be due to hemorrhages into the meninges and substance of the brain.

A very low platelet count, in itself, or a low platelet count with petechiae but without external bleeding are not sufficient grounds for splenectomy.

In this disease the spleen varies from normal to several times the normal size. Kaznelson lays stress on the importance of splenic enlargement and believes that such cases are especially favorable for operation because an enlarged spleen is capable of increased thrombolytic activity. However, the fact that the spleen cannot be palpated is not a contra-indication to splenectomy. In this group of reported cases, the results show that the benefits of the operation bear no definite relation to the size of the spleen.

#### DIFFERENTIAL DIAGNOSIS

Splenectomy is contraindicated in hemophilia and, with certain exceptions, in symptomatic or secondary purpura, two hemorrhagic conditions that should be excluded before removing the spleen in purpura hemorrhagica.

Hemophilia is easily recognized by the hereditary-male element in the history, the greatly delayed coagulation time, a normal platelet count, and the absence of purpuric spots in the skin or a prolonged bleeding time. The excessive bleeding in hemophilia is traumatic rather than spontaneous in origin. In purpura hemorrhagica it may be either traumatic or spontane-

ous. Hemophilia is seldom diagnosed as purpura hemorrhagica but purpura hemorrhagica with a high normal coagulation time and a history of repeated hemorrhages is readily mistaken for hemophilia unless the thrombopenia, the non-retractile clot, and the prolonged bleeding time are discovered by a complete blood examination.

The differentiation of primary purpura hemorrhagica from symptomatic purpura is often more of a problem. Primary purpura occurs most frequently in females and there is almost always a history of previous attacks. In symptomatic purpura, especially in the septic type, males are most often affected and there is no history of previous bleeding. A low platelet count, a non-retractile clot, a positive tourniquet test and a prolonged bleeding time are found in both forms of purpura. In purpura hemorrhagica large external hemorrhages occur with few petechiae while in symptomatic purpura the petechiae are often very numerous and wide spread with comparatively slight external bleeding. In purpura hemorrhagica there is a definite relation between the amount of bleeding and the degree of platelet deficiency. This is not true of symptomatic purpura. Very low platelet counts—20,000—are sometimes observed with little or no bleeding.

Occasionally the hemorrhages in symptomatic purpura are sudden in onset, excessive in amount and come from the mucous membranes as in a severe attack of purpura hemorrhagica. Since the blood examination, in such a case, will show all the features that are typical of primary purpura the separation of this type of symptomatic purpura from the acute form of true purpura hemorrhagica rests on the recognition of the underlying disease which means that a careful history should be taken and a complete physical and blood examination made in every case of purpuric bleeding.

Purpura hemorrhagica is comparatively rare but symptomatic purpura occurs as a complication in many diseases. The differentiation of these two forms of purpura is very important since splenectomy is sometimes a life-saving measure in purpura hemorrhagica while in certain diseases with symptomatic purpura it might lead to a fatal result.

In symptomatic purpura associated with such grave conditions as aplastic anaemia, lymphatic leukemia, nephritis and septicemia removal of the spleen would do more harm than good and there is no evidence that it will check the abnormal bleeding in these conditions.

Purpuric bleeding that occurs with cirrhosis of the liver and certain splenomegalias may be benefited by removal of the spleen. In such cases splenectomy is not contraindicated by the underlying disease.

Stress is laid on this phase of the subject to emphasize the fact that removal of the spleen is not indicated for all kinds of purpuric bleeding.

As the procedure comes into wider use serious results are apt to follow splenectomy unless these two forms of purpura, primary and symptomatic, are differentiated before operation. Engel<sup>2</sup> reports two acute cases in which the patients died a few hours after removal of the spleen and autopsy showed that the bleeding was probably secondary to septicemia in one case, and, in the other, to tuberculosis.

#### OPERATION

As a rule the operation of splenectomy in purpura hemorrhagica is not very difficult or dangerous. The spleen is usually free or very slightly adherent. With more than a moderate degree of anaemia it is best to prepare for the operation with a blood transfusion. If this is done a post-operative transfusion is seldom needed. The removal of the spleen checks the bleeding and seems to correct the hemorrhagic tendency with a promptness that is difficult to explain. Normal healing of the wound of operation can be expected without hematoma formation or bleeding from the abdominal incision. Occasionally the operation must be undertaken during an attack of very active bleeding. Under these conditions it is desirable to postpone operation but the uncontrollable nature of the hemorrhages may force the hand of the surgeon. These blanched, oedematous patients appear very sick but usually stand splenectomy surprisingly well if transfused just before the operation.

#### MORTALITY

The operative mortality should be low in purpura hemorrhagica if a correct diagnosis is made and the patient is properly prepared before removal of the spleen. In this group of almost 50 splenectomies a fatal result is reported in five cases. Two have already been mentioned, the cases of acute purpura following septic toxemia reported by Engel<sup>2</sup>. Kaznelson<sup>4</sup> had one anaesthesia death on the table. A fourth patient<sup>2</sup> with a subphrenic abscess died on the 29th day after operation. The fifth fatal result<sup>2</sup> occurred shortly after splenectomy in a typical case of purpura hemorrhagica with a red count of 2,500,000 in which the operation was performed during the stage of very active bleeding without a preliminary transfusion.

#### RESULTS

The immediate effect of splenectomy in this disease has been strikingly favorable and practically the same for all reported cases. In a typical case the bleeding and the tendency to bleed is promptly checked. The number of platelets in the circulatory blood increases rapidly after operation, reaching normal (250,000), or a figure well above normal within the first five or six days. This increase is not maintained.

It usually persists for two weeks or more and then gradually becomes subnormal again. After operation the platelet count does not remain at a fixed level being subject to rather wide fluctuations; seldom, however, sinking to the low point which marked the onset of abnormal bleeding before operation. The bleeding time, clot retraction, and capillary resistance also tend to return to normal but may change again from the normal if the platelets fall to a very low level. It is stated that these factors eventually become permanently normal even if the platelets are reduced, although as yet sufficient data is not available to establish this point with certainty.

The first effect of removal of the spleen in purpura hemorrhagica is, therefore, all that could be desired. The essential features of the disease, the bleeding, and tendency to bleed are practically eliminated by this procedure and for a short time the platelets are greatly increased. The perfection of these immediate results, however, becomes somewhat modified with the passage of time. The variations in the blood picture have been noted above. In a certain number of cases petechiae are observed from time to time and occasionally some of the patients report slight epistaxis. This bleeding usually stops spontaneously and almost never assumes the proportions of the hemorrhages observed before operation. In one case, a girl of 11, Kaznelson<sup>4</sup> reports frequent epistaxis after splenectomy which culminated during the second year in a prolonged nose bleed that required packing. This was coincident with an attack of gripe and enlargement of the cervical glands. Kaznelson ascribed the relapse in this case to the thrombolytic activity of this lymphoid tissue. The bleeding disappeared after recovery from the gripe and the patient was well when last observed six years after the operation.

Most of the reported cases cover at least the first year after operation and show that the early results of splenectomy are distinctly favorable. Although all the features of the disease have not been eradicated the patients are symptomatically well. As a rule the platelet count is below normal. In a few cases, the occasional appearance of petechiae and slight bleeding indicate that splenectomy has converted a severe purpuric disease to a purpura simplex or to a very mild form of purpura hemorrhagica.

In over eighty per cent of all these cases the disease occurred in females, and those in the catamenial age, almost always suffered with prolonged and excessive menstruation. These cases represent a type that is especially favorable for operation. The relief from this form of bleeding is prompt and apparently permanent.

Less data is available on which to base our conclusions as to the late or permanent results. In three cases of Kaznelson's results are reported at the end of six and seven year periods. Two other cases reviewed by Engel have been

followed for four and one half and five years. All these patients are reported well. In one case the platelet count was over 100,000. In others it ranged from 2,000 to 60,000. In one patient the only sign of purpura was an occasional outbreak of petechiae. None of the cases reported abnormal bleeding even after childbirth, ordinary injuries, or operations.

Various explanations have been offered to account for the beneficial effects of the removal of the spleen in purpura hemorrhagica. Some observers doubt the permanency of the results since in removing the spleen we eliminate only one part of the reticulo-endothelial system. Bedson<sup>15</sup> believes that the effect is only temporary and bases his conclusions on results obtained in splenectomized and non-splenectomized animals with experimentally produced purpura. Nagy<sup>16</sup> is skeptical of any result as he does not concede that splenic activity or platelet deficiency are essential factors in the pathogenesis of the disease. According to his view chronic purpura hemorrhagica is due to disfunction of the ovaries or other glands of internal secretion and increased fragility of the blood vessels is the direct cause of the bleeding. The reduction of the platelets is the result not the cause of bleeding in that these bodies are numerically exhausted in exercising their normal function to form platelet thrombi in the presence of capillary hemorrhage.

Frank and Kaznelson trace the results directly to removal of the spleen. In their opinion the compensatory activity of the remaining portions of the reticulo-endothelial system, the lymph glands and lymphoid tissue of the liver and bone marrow, is not sufficient to vitiate the good effect of splenectomy. In this connection attention has been drawn to the suggestive parallelism between purpura hemorrhagica and hemolytic jaundice. In one disease there is destruction of platelets with bleeding and anaemia, in the other a destruction of erythrocytes with jaundice and anaemia. Both diseases are greatly benefited by removing the spleen, one portion of the reticulo-endothelial system.

Brill and Rosenthal<sup>17</sup> conclude that the bleeding in purpura hemorrhagica is due to changes in the blood vessels and to a faulty production of platelets which affects both the quality and the quantity of these bodies. Removal of the spleen restores to the platelets their normal agglutinative and retractive properties and this improvement in the quality of the platelets accounts, in their opinion, for the absence of renewed bleeding even if the platelets sink again to a very low level after splenectomy.

Further, it should be noted that purpura hemorrhagica with no treatment is a disease of long duration which, in the course of time, ends in spontaneous recovery. It is a disease marked by intervals of definite and prolonged remissions although the remissions in untreated cases do not compare in duration with the long periods

free from bleeding that have followed splenectomy. In regard to the platelet increase after splenectomy it might be said that this has no special significance in purpura hemorrhagica since a marked temporary increase in the platelet count always follows removal of the spleen in man and in animals.

#### CONCLUSIONS

In view of these facts and conflicting opinions one hesitates to make very positive statements in regard to the effect of splenectomy in purpura hemorrhagica but a review of the results obtained in the reported cases seem to justify the favorable conclusions that have been drawn by most writers on this subject. It is evident that splenectomy has a very definite beneficial effect on the course of the disease. It controls the persistent bleeding when all other measures have failed and corrects the hemorrhagic tendency of these patients to the extent that they are no longer subject to attacks of disabling hemorrhages. From the patient's point of view the result is very satisfactory. Many, who have been anaemic invalids for years are returned to normal health.

While most of these patients are practically well, in a strict sense, it cannot be said that removal of the spleen always cures the disease since the signs of a mild form of purpura are observed after operation in a certain percentage of cases and the blood almost always shows the persistence of a varying degree of thrombopenia.

The end results in the five cases that have been followed for a five year period show that the beneficial effect of splenectomy in purpura hemorrhagica is not a temporary effect. None of these cases had relapsed at the end of this period. The relief from abnormal external hemorrhage is complete in every case. When last observed from four and one half to seven years after operation all the patients in these five cases were reported to be physically fit and symptomatically well.

#### CASE I

*Diagnosis:* Chronic continuous Thrombopenic Purpura.

A 28 year old, married woman admitted to the hospital on April 20, 1924.

*Family History:* Negative.

*Past History:* Patient has had typhoid, pneumonia and measles. Married at 21. No children. Had what was supposed to have been a miscarriage at 25.

*Present Illness:* At the age of 11 she began to have attacks of epistaxis and bleeding from the gums associated with petechiae and ecchymoses in the skin. The patient bruised easily and black and blue spots resulted from slight trauma. At times the ankles were swollen and tender. At the age of 14 she had an attack of headache, dizziness, and a period of unconscious-

ness followed by internal strabismus of one eye and diminished vision which suggested meningeal and retinal hemorrhages. Catamenia began at 14, has always been excessive in duration and quantity. Sometimes she flowed for six weeks. Two years ago consulted a gynecologist who found no pelvic cause for the menorrhagia. The diagnosis of chronic purpura hemorrhagica was made at this time from the blood examination (Minot).

**Blood:** April 26, 1922. Red count 2,712,000. Hemoglobin 35%. White count 7,600. Differential count showed polynuclears 75%, lymphocytes 18%, and large mononuclears 7%. Blood smear was characteristic of secondary anaemia. Fragility of red cells began at 0.42; complete at 0.20. Blood platelets were strikingly diminished, very few were observed (under 1000). Coagulation time normal. Clot rather soft, non-retractile.

For the past year the patient has had persistent slight nose bleed. The periods are always prolonged. The anaemia and attendant symptoms varies with the amount of bleeding. At present the patient's general condition is better than usual.

**Physical Examination:** Well developed and nourished woman. Heart and lungs negative. Abdomen soft, not distended. Liver and spleen not palpable. Pelvic examination negative. **Skin:** Petechiae and ecchymoses especially numerous over the legs below the knee and on the arms in the region of the elbow. A few minute purpuric spots on the eyelids. On the thighs and buttocks several black and blue areas 4-5 cm. in diameter. Temperature normal. Pulse 85.

**Urine:** Albumin 0. Sugar 0. Specific gravity 1018. Sediment negative.

**Blood:** April 22, 1924. Red count 4,000,000. Hemoglobin (Tallquist) 75%. Van Slyke's method on venous blood 78.5%. White count 5,800. Polynuclears 65%, lymphocytes 27%, and large mononuclears 8%. Stained specimen negative. Serum dilution—color disappears at dilution of 1-15. Bleeding time 40 minutes. Coagulation time—2 cc. venous blood—12 minutes. Clot somewhat soft in consistency. No retraction at the end of 24 hours. Blood platelets markedly diminished. Very difficult to find any in the blood preparations. The few observed seemed to average larger than normal. Blood group III.

**Splenectomy:** April 23, 1924. A non-adherent, normal sized spleen removed without difficulty. No unusual bleeding during operation.

**Pathological Report on Spleen:** (Dr. J. H. Wright). A spleen  $4\frac{1}{2}$  inches long, on section cut surface red, homogeneous, without visible follicles. The tissue is a little firmer than normal. Microscopical examination shows infiltration of the reticulum with small round cells resembling lymphocytes and collection of large

lymphocytes in the follicles. No other abnormality recognized.

The convalescence was normal. The wound healed by first intention without hematoma.

**Post Operative Report:** Blood specimen taken  $\frac{1}{2}$  hour after spleen was removed showed no clot retraction at the end of 24 hours.

Six hour report: Platelets did not appear to have changed in numbers. White count 12,000.

Twenty-four hours: White count 16,000. The platelets were definitely increased by estimation to slightly below normal.

April 30, 1924: 7 days after operation. Platelets have increased to normal. Clot shows firm retraction.

May 8, 1924: Red count 4,320,000. White count 7,800. Platelets at the lower normal limits, somewhat lower than in blood taken four days ago. Coagulation—blood clotted in normal time with normal contraction.

June 16, 1924: Red count 3,900,000. Hemoglobin 80%. White count 6,200. Platelets somewhat diminished below normal. Not as high as a week after operation. Coagulation time 8 minutes. Clot retraction normal. Bleeding time less than 3 minutes.

November 7, 1924: Patient reported in excellent health. Does not bruise excessively. No nose bleed. Two weeks ago had two teeth extracted without unusual bleeding. Periods normal. Has gained 10 pounds.

**Hemorrhagic tendency:** There has been no evidence of a tendency to bleed since the removal of the spleen. The petechiae disappeared one week after the operation and have not returned. Two weeks after operation there was a normal period of four days duration, the first normal period the patient ever had. Since then every period has been normal.

Blood platelets, in fresh and fixed smears, are definitely diminished below normal. Their estimated numbers are 120,000. Their character appears normal though occasionally one that appeared slightly more granular than normal was seen. Hemoglobin 85-90%. White count 10,000. Bleeding times 2 minutes.

April 13, 1925: Eleven months after operation. Patient reported in perfect health. Has gained fourteen pounds since operation. No bleeding or petechiae. Periods normal in every respect.

**Blood Examination:** Red count 4,480,000. Hemoglobin 85-90%. Stained specimen negative. White count 7,800. Differential count showed polynuclears 71%, eosinophiles 1%, lymphocytes 20%, and large mononuclears 8%.

Platelets normal or slightly below normal in number. Among them are a few rather unusually large and slightly more granular than normal.

Bleeding time normal. Tourniquet test negative. Coagulation time 25 minutes. Clot retraction normal.



CASE II

**Diagnosis:** Chronic Thrombopenic Purpura Hemorrhagica—acute phase.

A 13 year old girl entered the hospital February 10, 1924.

**Family History:** No history of hemophilia or other blood diseases.

**Past History:** At the age of 9½ years (Sept. 1921) had diphtheria and abscess in the throat which was followed by paralysis of the muscles of the throat, arms, and leg which disappeared after six months. During this time had three attacks of epistaxis lasting about one hour. In the spring of 1922 had an arthritis involving the fingers, knees, elbows, and shoulders from which she recovered at the end of 3 months with very little deformity. Mild attacks of epistaxis have occurred during the past two years on an average of every 4-6 weeks.

**Present Illness:** About one month ago while at school the patient had an attack of epistaxis which stopped spontaneously after soaking three handkerchiefs with blood. Four days later had another attack lasting 3½ hours which was stopped by packing. Two weeks ago had another attack of nose bleed lasting 6 hours, and relieved by packing. Four weeks ago an acute left ear which two days later discharged spontaneously. About one week ago the mother noticed black and blue spots on arms and legs with a fine petechial eruption over the upper trunk. Three nights ago began a severe attack of nose bleed which lasted throughout the night and the next day for which she was brought to the hospital.

**Physical Examination:** Very pale, sick looking child. Heart and lungs negative. Abdomen soft. Spleen palpable 3 fingers below costal margin. Liver one finger breadth below ribs. Slight oedema of the face. Numerous petechiae over lower extremities, around neck and on left arm, trunk, and on mucous membrane of soft palate. On left back there is a large hematoma, size of palm of the hand, also one on left thigh and in lobe of left ear. Bleeding from nose and gums. The lips are caked with blood and the nostrils are plugged with clots.

Temperature 103.5. Pulse 140. Respirations 28. Purulent discharge from left ear.

**Blood Examination:** Red count 2,284,000. White count 9,000. Hemoglobin 33%. Differential count showed polynuclears 66%, lymphocytes 20%, large lymphocytes 9% and myelocytes 5%. Blood smear shows changes of secondary anaemia with fair regeneration. Fragility of red cells 0.38-0.32. Wassermann negative. Blood culture showed no growth. Blood platelets markedly diminished, almost absent. Bleeding time over 1 hour. Coagulation time 6 minutes. Clot retraction—none at end of 16 hours. Blood group IV.

The bleeding from the nose continued in vary-

ing amounts for eight days and was partially controlled by packing. During this time fibrogen was given by mouth and subcutaneously without appreciable results. On February 18 there was an increasing epistaxis for 12 hours which was temporarily controlled by packing. On February 19 a transfusion of 425 cc. of blood was given which improved the general condition and stopped the bleeding for two days when the nose bleed recurred and it was decided to remove the spleen.

Blood examination the day before operation showed the red count 2,380,000. Hemoglobin 40%. White count 10,000. Platelets very few seen in blood preparation. Bleeding time 12 minutes. Coagulation time 9 minutes. No retraction in 24 hours.

**Splenectomy:** February 23, 1924. The patient was brought to the operation table with nostrils plugged but bleeding from the nose and spitting blood. A preoperative transfusion of 400 cc. of blood was given which did not check the nose bleed. An enlarged non-adherent spleen was removed without difficulty. There seemed to be more than normal bleeding from the abdominal wound but not from the spleen bed or pedicle. Still slight bleeding from the nose at the end of the operation for which the nostril was repacked.

**Pathological Report on Spleen:** (H. F. Hartwell). The spleen weighs 157 grams and measures 4x8x12.5 cm. It shows a firm purplish-red surface on section with prominent follicles. A microscopic examination shows hyperplasia of the cells of the lymphocyte series. There are no myeloid elements. No nucleated reds can be found. There are occasional megakaryocytes. Eosinophilic leukocytes are fairly common. Hyperplasia.

With the exception of slight superficial wound sepsis the convalescence was uneventful. There was no evidence of further bleeding. Frequent blood examinations showed that the platelets were markedly increased the day following operation and were above normal 1 week after operation. The bleeding time two days after operation was 2½ minutes. Before discharge on the 16th day red count was 3,896,000, white count 13,400. Platelet count normal or above. Clot retraction normal.\* One week later red count was 5,104,000. Hemoglobin 65%. Platelets showed some reduction.

Reported November 3, 1924: General condition good. Has had slight nose bleed twice. No purpuric spots. Bleeding time 3 minutes. Coagulation time 8½ minutes. Clot retraction normal. Blood smear shows plenty of platelets.

April 18, 1925: Fourteen months after operation. Reports in poor general condition on account of chronic arthritis for which the patient is under treatment. Has no external bleeding or petechial eruption.

**Blood Examination:** Red count 4,800,000.

Hemoglobin 80%. White count 20,000. Smear showed polynuclears 71%, lymphocytes 24%, mononuclears 4%, and eosinophiles 1%. Red cells show slight variations in size greater than normal, with tendency to large cells—one coarsely stippled cell seen—no polychromatophilia, achromia, phagocytosis, or parasites. Platelets greatly increased, four or five times the normal number. Some large forms seen.

Bleeding time normal. Tourniquet test negative. Coagulation time 9 minutes. Clot retraction moderate in one hour; marked retraction in 3 and 18 hours. Clot normally elastic.

## CASE III

**Diagnosis:** Chronic Thrombopenic Purpura Hemorrhagica—acute phase.

A 14 year old girl admitted to the hospital on May 23, 1924.

**Family History:** Negative.

**Past History:** On August 26, 1919, entered hospital with following history. Severe attack of epistaxis six weeks ago which required packing. For three weeks epistaxis of  $\frac{1}{2}$  hour's duration recurred every 3-4 days. Three weeks ago purpuric spots on skin from size of pin to 50 cent piece. When examined in hospital there was bleeding from the nose and gums and purpuric spots on the skin and mucous membrane of mouth.

**Blood Examination:** Red count 2,592,000. White count 13,800. No platelets seen. Bleeding time 30 minutes. Coagulation time 6 minutes. Non-retractile clot.

**Diagnosis:** Idiopathic purpura hemorrhagica. The patient was given four blood transfusions which improved the general condition but only gave a few days relief from the bleeding. Patient bled less frequently and profusely from nose and gums but continued to bleed up to October 24, 1919, the day of discharge.

**Present Illness:** Since leaving hospital  $4\frac{1}{2}$  years ago patient has had periodic nose bleed and oozing from gums. Three months ago stopped going to school on account of weakness. Three months ago began to menstruate for the first time and since has flowed continuously 2-3 napkins per day. Was transfused two months ago. One week ago noted a crop of purpuric spots which appeared in all parts of the body.

**Physical Examination:** A well developed and nourished, pale young girl. Large ecchymosis over arms and legs and many small petechiae. Chest showed a few moist rales in both bases posterior. Heart was very active, rapid, tic-tac rhythm, with a soft systolic murmur over base and apex. Abdomen retracted. No tenderness. Liver edge felt below costal margin. Spleen not palpable. Rectal examination negative. Bloody discharge from vagina.

Temperature 101. Pulse 140. Respirations 35.

**Blood Examination:** Red count 3,464,000. Hemoglobin 35%. White count 9,600. Platelets

very few, occasional large forms seen. Bleeding time 45 minutes. Coagulation time 5 minutes. Poor clot retraction at the end of four hours. Blood group IV.

May 26, 1924: Blood transfusion—600 cc.—followed by *Splenectomy* (G. W. W. Brewster). Spleen of normal size and slightly adherent—removed. Bleeding controlled without difficulty.

**Pathological Report on Spleen:** (H. F. Hartwell). The spleen weighs 135 grams and measures  $4 \times 7.5 \times 11.5$  cm. Capsule not thickened. On section it shows a firm brownish-red surface with distinct follicles. Microscopic examination shows fibrosis of the pulp. The follicles are numerous. An occasional megakaryocyte is found in the sinuses. Hyperplasia.

The wound healed by first intention without hematoma. There was a slight vaginal staining for four days which stopped before discharge on the 13th day.

Three days after operation the platelets were present in normal number. The bleeding time was normal and clot retraction was good after one hour. Two days before discharge the platelets were about  $\frac{1}{2}$  normal and clot retraction was good.

Patient reported on November 3, 1924. Since discharge the periods have been normal. No purpuric spots or bleeding.

**Blood Examination:** Bleeding time  $4\frac{1}{2}$  minutes. Coagulation time 19 minutes. Good clot retraction. Platelets—smear shows platelets slightly diminished in number and there are many large forms.

April 18, 1925. Eleven months after operation. Reports in normal health. Has no abnormal bleeding or petechial eruption. Blood examination: Red count 4,880,000. Hemoglobin 80%. White count 7,000. Smear shows polynuclears 68%, lymphocytes 25% and mononuclears 7%. Reds showed slight variation in size. No achromia, polychromatophilia, stippling, parasites, phagocytes, or young forms. Platelets—Two or three times normal number, many large forms seen. Bleeding time normal. Tourniquet test negative. Coagulation time 15 minutes. Clot retraction slight in one hour, moderate retraction in 3 hours, firm retraction in 18 hours, clot slightly more friable than normal.

## CASE IV

**Diagnosis:** Chronic Thrombopenic Purpura Hemorrhagica.

A six year old girl admitted to hospital on November 28, 1924.

**Family History:** Negative.

**Past History:** Measles one year ago. Was a strong baby and in excellent health until present illness.

**Present Illness:** On September 10, 1924, had two teeth extracted following which there was profuse bleeding from the gums for 24 hours

that was finally controlled by local measures. One week later bleeding from the right nostril for about two hours. One month later bleeding from the left nostril for 2 hours or more. In past 2 weeks the attacks of epistaxis have been more frequent occurring every other day. Today epistaxis began at 6 A. M. and persisted until 5 P. M. at the time of entrance.

**Physical Examination:** Well developed and nourished girl lying quietly in bed with small amount of blood oozing from left nostril. Mucous membranes pale. No petechiae. No bleeding from gums. Heart and lungs negative. Abdomen soft and not distended. Liver edge palpable below costal margin. Spleen edge not felt. Temperature 100. Pulse 120. Respirations 24.

**Urine:** Albumin slightest possible trace; sugar 0; specific gravity 1030. Sediment showed a few white blood cells and urates.

**Blood Examination:** Red count 3,240,000. Hemoglobin 60%. White count 7,200. Polynuclears 60%, lymphocytes 32%, large mononuclears 6%, eosinophils 1%. Basophils 1%. Smear shows marked achromia, some poikilocytosis, some anisocytosis, rare polychromatophilic red cell. Platelets: Practically no platelets found in blood smear. Bleeding time 18 minutes. Coagulation time 10 minutes. Clot retraction none in 24 hours. Wassermann negative. Blood group IV.

No bleeding from the day of entrance to the fifth day when epistaxis began which required packing of the right nostril with adrenalin soaked gauze. The bleeding time was prolonged to 35 minutes. Slight bleeding from gums. The next day a blood transfusion of 250 cc. was given. No bleeding for two days then epistaxis which again required packing. Several small purpuric spots noted over lower extremities, abdomen, thorax, and neck.

December 18, 1924: Blood transfusion 250 cc. followed by *Splenectomy* (G. W. W. Brewster). A non-adherent spleen was removed without difficulty. No unusual bleeding.

Easy convalescence. Discharged on the 15th day after operation. Very little nose bleed on the 4th day which stopped spontaneously.

**Blood findings:** The day before operation—platelets very scarce, only one platelet found in 10-12 high power fields.

Two days after operation: Platelets still very much diminished.

Four days post-operatively: Clumps of full-sized platelets found in each high power field ranging from 1-3 clumps of 10-15 platelets.

December 16, 1924: Eight days after operation. Red count 4,960,000. Hemoglobin 90%. White count 8,500. Platelets are normal or above in numbers—large size. Bleeding time 3 minutes. Coagulation time 4 minutes. Normal clot retraction.

The blood findings on the 15 days were practically the same as above.

There was no bleeding and the child was discharged in excellent physical condition.

**Pathological Report:** (H. F. Hartwell). The spleen measures 2.5x2.5x14 cm. and weighs 125 grams. On section it shows a firm, bright red surface with visible follicles. Microscopic examination shows an increase of the connective tissue of the reticulum with a hyperplasia of the lymphoid cells of the sinuses of the pulp. There is no evidence of hematopoiesis. The lymph nodules do not show prominent germinative centers. Hyperplasia.

April 17, 1925. Four months after operation. General condition excellent. No bleeding or purpura. Blood Examination: Red count 5,440,000. Hemoglobin 85%. White count 7,200. Platelets—moderately increased in number, average of large size. Bleeding time normal. Tourniquet test negative. Coagulation time 10 minutes. Clot retraction—good retraction at 2 hours, firm retraction at 6 hours.

#### CASE V

**Diagnosis:** Cirrhosis of Liver. Secondary Thrombopenic Purpura Hemorrhagica.

A 64 year old, married woman admitted to hospital June 10, 1924.

**Family History:** Negative.

**Past History:** General health always good. No children. Menopause at normal time. Periods were always regular without excessive flow.

**Present Illness:** Four years ago had extraction of teeth for severe pyorrhea followed by prolonged and excessive bleeding from the gums. From this date occasionally noticed purpuric spots on the legs and arms and a tendency to nose bleeding; epistaxis sometimes lasted for a day but the amount of blood lost was not large.

Three months ago these symptoms became more marked and the patient consulted a doctor who made the diagnosis of purpura hemorrhagica and advised splenectomy. Blood examination at this time showed a secondary anaemia, much diminished platelet count, a prolonged bleeding time, a delayed coagulation time and poor clot retraction.

Three days ago the patient fainted while at work and had a large dark bloody stool which was followed by other bloody stools smaller in amount. The last stool examined showed no blood. Patient admitted to hospital June 10, 1924.

**Physical Examination:** Fairly well developed, thin, pale woman. Lungs negative. Heart showed a systolic murmur without increase of cardiac dullness. Abdomen was soft and retracted. Spleen edge felt at costal margin. Liver not palpable. Pelvic and rectal examinations negative.

**Skin:** No jaundice. Purpuric spots on lower

legs, thighs, and arms, the largest 4 cm. in diameter. Temperature and pulse normal.

*Urine* negative.

*Blood Examination:* Red count 3,500,000. White count 5,000. Platelets,—very few observed in blood preparation. Bleeding time 10 minutes. Coagulation time 24 minutes. No retraction in 24 hours. Cells settled in bottom of tube. Wassermann negative. Blood group IV.

June 11, 1924. Transfusion: 650 cc. of whole blood.

June 12, 1924. *Splenectomy:* Small amount of free fluid in abdomen. Small cirrhotic liver. Very adherent spleen about  $2\frac{1}{2}$  times normal size. Adhesions between liver edge and spleen surface which contained many enlarged veins. After consultation decision made to remove spleen. This was accompanied by the expected excessive bleeding from the spleen bed. No unusual bleeding from spleen pedicle or abdominal wound. Emergency transfusion on operating table—700 cc. Deep gauze packing to control hemorrhage.

Following operation the patient was in considerable shock for 20 hours but after this never in serious condition. No evidence of unusual post-operative bleeding. Gauze pack removed on the 4th day after operation without undue bleeding.

*Pathological Report on Spleen:* (J. H. Wright). A large, plump spleen  $6 \times 4\frac{1}{2} \times 2\frac{1}{2}$  inches. On section cut surface generally dark

red, with prominent trabeculae and inconspicuous follicles. The tissue is of fairly firm consistence. Microscopic examination shows increase of the interstitial tissue and an excess of cells of the lymphocyte series in the pulp. The sinuses seem small and are not prominent. No hematopoiesis.

*Blood examination* three days after operation showed blood platelets increased to normal. Bleeding time 7 minutes. Coagulation time 10 minutes. Normal clot retraction.

The convalescence was slow but steady. During the two months that the patient was under personal observation there was no bleeding or return of the purpura spots which disappeared a week after the operation. Nine months after the operation the patient reported by letter that she had gained 15 pounds in weight, was gaining in strength and showed no recurrence of the hemorrhagic tendency. A detailed blood report could not be obtained.

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## A SKETCH OF THE DEVELOPMENT OF MEDICAL DIAGNOSIS\*

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A KNOWLEDGE of the growth of medical science is of general interest because it is one of the outstanding achievements of modern civilization. Its history reveals the struggles, failures and successes of the mind of man to gain insight into the mysterious workings of the human body in health and disease, to discover the nature and causes of disease, to effect its cure and to prevent its occurrence. It is well to remember that modern medicine is the fruit of the labor of those who have gone before. It is also well to call to mind the men who did the most for the advancement of medicine. Like pioneer workers in other fields many of them received little or no recognition for their discoveries in their own life time.

Scientific medicine of today has its roots deeply planted in the culture and learning of ancient Greece. Although doubtless many men now unknown aided in preparing the soil there is one outstanding figure. In the fifth century before Christ lived a man who has ever since been regarded not only as the Father of Medicine, but as the wisest of physicians. This

was Hippocrates. In spite of the fact that he was called the great Hippocrates even during his life time, he is rather a shadowy figure. He lived in the Golden Age of Pericles and was a contemporary of Socrates. He came of a family of physicians and was born about the year 460 B.C. in Cos, a small island near the coast of Asia Minor. Here was situated one of the three most famous Temples of Health. They were erected to Aesculapius, the god of healing. They were the earliest hospitals recorded in history. To these Aselepieia, always located on healthful sites, "hard by fresh springs and surrounded by shady groves, the sick and the maimed resorted to seek the aid of the god of health." (Huxley) In addition to prayers and sacrifice there was the special rite of incubation or temple sleep. The patients' dreams were interpreted by the priests and remedies prescribed. Restored patients erected votive tablets in gratitude to the god on which were recorded the symptoms and the treatment. The sick were treated by secular physicians as well as by the priests. It is surprising that Hippocrates brought up among such surroundings

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should have been free from all superstition, but that he was is evident from his writings. In his treatise on epilepsy, then called the sacred disease, this is the opening sentence: "It is thus with regard to the disease called sacred: it appears to me to be no wise more divine, nor more sacred than other disease, but has a natural cause from which it originates like other affections. Men regard its nature and cause as divine from ignorance and wonder, because it is not at all like other diseases."

Hippocrates was an acute and painstaking observer. The ancient diligence of Hippocrates is a frequent phrase in medical writings. He made careful observations of his patients, repeated from day to day, and recorded the daily progress of his acute cases in concise but definite fashion. His method must have seemed foolishness to those of his own day, wise in their own conceits, and would so appear to many now.

After the time of Hippocrates the careful observation and the recording in detail of facts observed at the bedside was neglected for almost 2000 years. The method was not employed by anyone, during this long period, with the exception of his immediate disciples and possibly Erasistratus of Alexandria. Modern medical science recognizes that trustworthy observation is the foundation stone of knowledge and without it clinical experience builds a house on sand. This may seem self-evident but the fact is that the value of training in the faculty of observation is not yet sufficiently appreciated by many teachers and students of medicine. It would be well once again to raise the cry "Back to Hippocrates." It was his method of work at the bedside that makes him a living force today.

In his examination he observed chiefly the state of nutrition, the expression of the countenance and the eyes, the coloration, the position and movements of the patient, the warmth and coldness of the body surface, the manner of breathing, the condition of the abdomen, the sputa, vomitus, faeces and the urine. (Wunderlich.) Strange to say he paid practically no attention to the pulse. He felt the abdomen with his hand and learned to recognize by the sense of touch swelling of the spleen and the liver. This is all the more remarkable because neither he nor his predecessors had made a dissection of a human body and their knowledge of anatomy was in consequence very crude.

He reported in his work on epidemics 42 cases of which 25, nearly two-thirds, ended fatally. I will give a portion of one of his case reports because it shows how objectively he describes the condition of his patients and with what terseness he presents the progress of the disease. The case was evidently one of pernicious malarial fever of the haemorrhagic form that prevailed in Thessaly and Thrace. The

same type of disease has been observed in modern times in the same regions.

CASE III. Herophen was seized with an acute fever; alvine discharges at first were scanty, and attended with tenesmus; but afterwards they were passed of a thin, bilious character, and frequent; there was no sleep; urine black, and thin. On the fifth, in the morning, deafness; all the symptoms exacerbated; spleen swollen; distension of the hypochondrium; alvine discharges scanty, and black; he became delirious. On the sixth, delirious; at night, sweating, coldness; the delirium continued. On the seventh, he became cold, thirsty, was disordered in mind; at night recovered his senses; slept. On the eighth, was feverish; the spleen diminished in size; quite collected; had pain at first about the groin, on the same side as the spleen; had pains in both legs; night comfortable; urine better coloured, had a scanty sediment. On the ninth, sweated; the crisis took place; fever remitted. On the fifth day afterwards, fever relapsed; spleen immediately became swollen; acute fever; deafness again. On the third day after the relapse, the spleen diminished; deafness less; legs painful; sweated during the night; crisis took place on the seventeenth day; had no disorder of the senses during the relapse.

Nothing more unmistakably shows the high moral character of Hippocrates than that he coined the "magic word philanthropy." Commentators, Osler points out, have lingered over a sentence in the writings of Hippocrates in which he associated the love of humanity with the love of his craft—"philanthropia and philotechnia—the joy of working joined in each one to a true love of his brother."

In his aphorisms Hippocrates presents the results of his experience. In the first one of these speaks "the reflective philosopher and the practised physician." "Life is short, and the Art is long; the Occasion fleeting, Experience fallacious, and Judgment difficult. The physician must not only be prepared to do what is right himself but also to make the patients, the attendants, and externals coöperate." The oath of Hippocrates which Osler calls "the high water mark of professional morality" is still administered in many universities to candidates for the degree in medicine.

Hippocrates busy with the study of the natural history of disease took little interest in theories and speculations. He was ignorant of the nature of disease. He believed that there were four humors: blood, phlegm, yellow bile, black bile. In health these humors existed in the proper mixture, when this was disturbed, disease resulted. This theory of disease has given us the word melancholy, and the layman's idea of biliousness is a survival of the Hippocratic teaching.

To the Greeks the word philosophy meant

what is now called science, that is systematic knowledge. Aristotle, the "Master of those who know," was not only the son of a physician, but grew up in the atmosphere of the Greek science of medicine. He "owed to it his respect for the results of experience, his keen perception of fact and his carefulness as to details in investigation." (Windelbrand.)

Herophilus of the School of Alexandria, which flourished under the Ptolemies, deserves to be mentioned in connection with the development of diagnosis, as he was the first to study the arterial pulse which he attempted to count by means of a water clock.

Next to Hippocrates, the greatest name in ancient medicine, is that of Galen of Pergamos, who was born about 130 A. D. He practised in Rome and was the physician of Marcus Aurelius. Galen was a keen student and a voluminous writer. He diligently studied the works of Hippocrates and his commentaries on Hippocrates became famous. He never, however, caught the spirit of that greater master of medicine. Although he regarded himself as a disciple, he did not follow the method of Hippocrates. Galen made no systematic observations and recorded no cases in detail. No man in medicine ever exerted so great an influence, or for so long a period of time. For 1400 years his writings were the final authority. No appeal could be made even to Nature itself. He was called the prince of physicians and his opinions were regarded through the Middle Ages as infallible. "He had an answer ready for every problem, a reason to assign for every phenomenon." (Garrison.)

He did develop knowledge of the pulse begun by Herophilus as the following story shows. Being called by a lady who complained of general malaise he found the pulse slow and the skin cool. He realized that her trouble was of mental origin. Probably he had heard stories of her love affairs. At any rate when he mentioned the name of a certain actor, Pylades, he noticed that the pulse became rapid and irregular. The next two days he repeated his observation, but brought into the conversation the name of another actor, Morphus. There was no change in the pulse rate. On the evening of the fourth day when he remarked that Pylades was dancing, the pulse again became accelerated and irregular. Then he knew she was love sick. Galen recognized as this incident shows that an irregularity of the heart's action (extrasystoles) may be due to emotional disturbances. This is often thought to be a modern discovery.

Experimental physiology began with Galen. By tying an artery at two places and cutting the vessel between them he proved that it contained blood and not air as had been previously taught. He made many brilliant experiments but this was one of the most important.

Galen made as thorough a study of anatomy

as possible using chiefly pigs and apes. Such was the superstition of the age that he never had an opportunity to examine the interior of the human body. Four hundred and fifty years before his time the study of human anatomy by means of dissection had been begun in the famous school at Alexandria and important discoveries made. But when Galen visited the school, the examination of the dead body was no longer permitted and two skeletons were all that remained of the anatomical preparations.

Modern human anatomy dates from the studies of Andreas Vesalius, whose great work with the title, "*De Humani Corporis Fabrica*," appeared in 1543. Up to this time the anatomical descriptions by Galen were regarded as infallible. Dissections were rare when Vesalius began his studies. He was elected professor of anatomy at the University of Padua, on his graduation in 1537, when only 24 years old. He at once began his original studies and evidently was able to secure abundant material with which to continue his work. He realized that to understand the working of the human machine (physiology) it was first necessary to know the parts of which it is made up. His book with its beautiful and accurate illustrations represented five years of continuous labor. It is doubtful if any other volume in medical literature compares with it. The publication of this *magnum opus* by Vesalius called forth a storm of protest. His old teacher, Sylvius, denounced him in bitter terms. "Galen ruled supreme in the schools: to doubt him in the least particular roused the same kind of feeling as did doubts on the verbal inspiration of the Scriptures fifty years ago!" (Osler) Vesalius, then only 30 years old, was so filled with anger and resentment by the denunciations heaped upon him by all medical men of note, that he burned his books and unpublished manuscripts and gave up in disgust the study and teaching of anatomy. He afterwards repented of his impatience and rashness.

Next to Vesalius the man who exerted the greatest influence upon modern medicine was William Harvey. He discovered by the experimental method that the heart was a force-pump and that the blood moved from the heart through the arteries and veins in a circle. Up to the time of Harvey the absurd idea of Galen had been universally accepted that the blood passed through the thick muscular wall between the right and left ventricles by means of invisible pores. Harvey's "*De Motu Cordis*" was published in 1628. Although a great physiologist he was not eminent as a physician. His work at once stimulated fruitful anatomical and physiological investigations but many years passed before his discovery was of any aid in the diagnosis and treatment of disease.

The first physician, who from the enduring quality of his contributions to clinical medicine, if not in point of time, deserves to be

classed as a modern, was Thomas Sydenham, justly called the English Hippocrates, and the "Prince of English Physicians, at the mention of whose name Boerhaave invariably removed his hat." (John Brown) It was Sydenham who "first consciously and clearly gave clinical observation its place of honor as a scientific method." (Faber) He was born in 1624, four years before Harvey published his great discovery. Sydenham was able by his powers of observation alone to enrich greatly man's knowledge of the natural history of both acute and chronic disease. He was the first to recognize that scarlet fever and measles are distinct diseases, and he differentiated gout from other forms of arthritis. His descriptions of certain diseases have become classical, and are still employed with slight changes by writers of text-books. A few years ago in preparing an article on gout for a system of medicine I included the word picture that Sydenham drew of an attack of acute gout. Although nearly 300 years old it needed very little retouching.

The only medical author to whom he referred as an authority was Hippocrates. When asked by a young student what books one should study to acquire medical knowledge he replied, "Don Quixote." This answer indicates his opinion of the medical teachings of his day. He probably also meant to convey the undoubted truth that medicine was not to be learned by reading but from study of the open book of nature. He appreciated the value of anatomy as a guide to the physician and said that "he who wants this knowledge is like a man fighting blindfold, and a mariner without a compass." Sydenham's observations were all made at the bedside. He was not connected with any hospital and this possibly explains the fact that he made no postmortem studies on the changes wrought by disease on the internal organs.

The man who taught men to think anatomically of disease was Morgagni, who published the first great work on pathological anatomy, entitled *The Seats and Causes of Disease—De Sedibus et Causis Morborum per Anatomicen Indagatis* (1761). It dealt with the correlation of the symptoms exhibited by patients and the alteration in the organs found after death. It was "only the extension of the Hippocratic method of careful observation, the study of facts from which reasonable conclusions could be drawn." (Osler.)

Two true followers of Sydenham and his methods deserve special mention,—William Heberden and Caleb Hillier Parry. By the careful study of their patients' symptoms together with the methodical recording of their observations they were able to advance medical diagnosis.

In the preface of his famous *Commentaries* Heberden says, "the notes from which the following observations were collected, were taken in the chambers of the sick, from themselves,

or from their attendants, where several things might occasion the omission of some material circumstances. These notes were read over every month and such facts, as tended to throw any light upon the history of a distemper, or the effects of a remedy, were entered under the title of the distemper in another book, from which were extracted all the particulars here given, relating to the nature and cure of diseases. It appeared more advisable to give such facts only, as were justified by the original papers, however imperfect, than to supply their defects from memory, except in a very few instances, or then to borrow anything from other writers." This method yielded rich results. His greatest achievement in advancing clinical diagnosis was the discovery of angina pectoris. He gave to medical science both the name "angina pectoris" and the first accurate description of that disorder.

To Sir John Floyer belongs the credit of attempting to introduce a method of examination that is without doubt used more frequently to-day than any other diagnostic measure. It is the simple procedure of taking the pulse rate per minute. In 1707 he published a volume entitled the *Physician's Pulse Watch*. In the preface he says, "I have for many years tried pulses by the minute in common watches and pendulum clocks, when I was among my patients; after some time I met with the common sea-minute glass, which I used for my cold bathing, and by that I made most of my experiments; but because this was not portable, I caused a pulse-watch to be made which ran 60 seconds, and I placed it in a box to be more easily carried, and by this I now feel pulses." He was alert and resourceful and for his day and generation a good observer. Furthermore, to quote Weir Mitchell, he "knew the world, for he predicts, alas, too truly, that this new method will be sneered at and neglected."

In 1768 Heberden read at the College of Physicians a summary of his observations on the pulse rate. It is an admirable paper, and can be studied with profit today.

The first to record frequent and accurate observations of the pulse-rate in his published notes on cases was that other great disciple of Sydenham, the distinguished physician of Bath, Caleb Hillier Parry. It was also Parry who first gave a full description of exophthalmic goitre, a disease to which his name should be attached rather than that of Graves or Basadow. The studies of Heberden and Parry made no impression on their contemporaries across the English channel, and the middle of the nineteenth century was reached before the "familiar figure of the doctor, watch in hand, came to be commonplace" (S. Weir Mitchell).

Until new methods of investigation were discovered the clinical diagnosis of disease advanced but little beyond the high mark set by Sydenham and Heberden. The first of these

new methods was that of percussion. Its use in diagnosis was discovered by Auenbrugger of Vienna in 1761. This was an event of the greatest importance. Auenbrugger tells us he was prepared to suffer from envy, hatred and calumny, "we know that he endured what is harder to bear,—simple neglect" (Gee). Although it is a fact that even today percussion properly used by a trained physician is of more value in diagnosis than a whole chemical laboratory, little attention was paid to this wonderful invention until Corvisart, the great French physician, in 1808 made Auenbrugger's discovery known to the world by publishing a French translation of the *Inventum Novum*, and by giving his endorsement to the method which he had then employed for twenty years. Since that time its value has been admitted by all. By means of percussion the outlines of the heart, lungs, and liver can be marked out with reasonable accuracy and changes produced in the structure of the lung by disease can be recognized. The method is very simple, but the medical student finds that it is more difficult to acquire proficiency in this technical procedure than in any other means of diagnosis taught in the schools.

"Clinical observation, though never blind, had been always deaf," until Laennec discovered auscultation. The story of its discovery is an interesting one. It seems that Corvisart, who was Laennec's master, used to study with care the character of the impulse produced by the striking of the heart against the chest. Bayle, a pupil of Corvisart, found that he could detect a heaving impulse, which is often present when the heart is enlarged more readily with his ear against the chest than with his hand, and young Laennec, his friend and fellow student, adopted the same method. Corvisart himself never used it. For fifteen years Laennec had continued his training in the hospitals of Paris when one day in 1816, while examining a young girl who presented symptoms of heart disease, but in whom palpitation and percussion gave no information on account of the patient's fatness, and feeling that her age and sex forbade putting the head to the chest, Laennec happened to remember that the scratching of one end of a plank can be heard by the ear applied to the other end. He seized a quire of paper, rolled it up tight, placed one end over the heart and his ear to the other end, and found to his surprise that he heard the beating of the heart more distinctly than when the ear was applied directly to the chest. The genius of Laennec was shown by the use he made of his discovery. Like another Columbus he explored at the Hôpital Necker the new world he had gained for science. In 1819 the first edition of his *Traité de l'auscultation médiate* appeared. It is remarkable that so complete and thorough was his study of the sounds heard in the diseased lungs that his successors found little to add and

little to correct. For the roll of paper he substituted a solid cylinder of wood. Many modifications in the structure of the stethoscope have been made. In Germany a rigid tubular mono-aural stethoscope is used while in this country some form of binaural stethoscope is almost universally employed. The value of auscultation was soon recognized especially in England, Ireland and this country. In looking over the first volume of case reports at the Massachusetts General Hospital, I found that attempts to use auscultation were made within a year of the opening of the hospital in 1821. Undoubtedly this early introduction of the auscultatory method was due to Dr. James Jackson, the leading physician of his time in New England, and the peer of his contemporaries in Europe. Writing in the same year (1821) John Forbes, the translator of Laennec, said he knew of only two English-speaking physicians, who had given the practice a fair trial.

Laennec did more than discover auscultation, much more. It was he who first sought and found the confirmation of the clinical diagnosis at the autopsy table and united pathological anatomy and clinical medicine by an inseparable bond. Morgagni had raised the question, what changes are produced by the disease? Laennec went further and asked by what symptoms or sign are these changes to be recognized during life? In answering this question Laennec created local diagnosis (Naunyn).

Students soon flocked to Paris from all parts of the world there to learn the new method of stethoscopy and to be instructed in the anatomical diagnosis of disease. America was well represented by the ablest young men from Boston, New York and Philadelphia. Corvisart and Laennec were gone, but they left worthy successors, who extended the work they had begun, guided by the same principles of research. The leader of this group of investigators in Paris was Louis. He aroused in the young men from America, who aided him in his researches, the greatest zeal and ardor in the advancement of medicine. Through them his influence on American medicine was very great. I have heard Sir William Osler say that Louis should be recognized in Boston as the patron saint of the Massachusetts General Hospital. Louis was a most painstaking investigator both in the wards of the hospital and at the autopsy table. "Modest in the presence of nature, fearless in the face of authority, unwearied in the pursuit of truth, he was a man whom any student might be happy and proud to claim as his teacher and his friend" (Holmes). No one could have been more exact in making observations. For nearly seven years abandoning all private practice he spent his entire time in the hospital. He was aware of the great danger of being misled by the impression he had formed. He devised what was called the nu-



merical method. "This was an attempt to substitute series of carefully recorded facts rigidly counted and closely compared, for those never ending records of vague unverifiable conclusions with which the classics of the healing art were overloaded" (Holmes). He abhorred inexact statements, "about so many," when definite facts could be ascertained. As a motto for his monograph on typhoid fever he cites the following quotation from Rousseau:—"I know the truth is in the facts and not in my interpretation of them, and the less I am influenced by my opinion the more surely will I approach the truth."

These were stirring days in the first part of the last century for men who caught the new spirit in clinical and anatomical investigation. From 1825 to 1850 nowhere in the world did the fires on the altar of Minerva Medica burn more brightly than in the small Meath Hospital in Dublin. Here worked two of the greatest physicians of the age,—Robert Graves and William Stokes. Graves was always seeking for new truths as he worked at the bedside. In the words of a colleague he struck the rock and living waters gushed forth. His original investigations were characterized by diligence and accurate observation followed whenever possible from the beginning to the termination of every case. The contributions he made to knowledge were incorporated in his two volumes of clinical lectures. No work on clinical medicine of that period served a more useful purpose. It was held in as high esteem in France as in the English-speaking world. Trousseau modeled his own famous lectures upon it and entreated his pupils to consider it as their breviary. Stokes is a name familiar to every medical student, because of the conditions to which his name is linked. His work on diseases of the heart marked a great advance in knowledge.

In London during this same period there were great men working at Guy's Hospital,—Bright, Addison and Hodgson. All three recognized and described clinical conditions that bear their names. Richard Bright was the most distinguished of the three and is accounted the leading English physician after Sydenham. He showed by his combined clinical and anatomical studies that in cases of dropsy in which the urine was coagulable by heat, the seat of disease was in the kidneys. This was a momentous discovery. His report on medical cases which contained a description of the clinical course and of the marked changes found at autopsy in the kidneys was published in 1827. It is illustrated with fine colored plates. Since that time the relation of albumin in the urine to diseases of the kidney has been universally recognized. The facts which establish this connection now appear so simple that it is hard to appreciate "the amount of labor, the accuracy of the observation, and the rigid

adherence to the inductive method which characterized the whole of Bright's researches" (Barlow).

A method of precision used as an aid to diagnosis in the study of every case of fever in every properly conducted hospital in the world today is a systematic record of variations in the bodily temperature.\* The introduction of the use of the thermometer as a routine procedure is due to the classical studies of Carl A. Wunderlich of Leipzig. Before his book appeared in 1868 he had been studying the course of the temperature in various diseases uninterruptedly for 16 years. During this period the temperature of the patients had been taken at least twice daily, and in febrile conditions four or more times daily. His material comprised "many thousand complete cases of thermometric observations of disease, and millions of separate readings of the temperature." The form of temperature chart that Wunderlich devised is better, in my opinion, than the ones used in Boston hospitals today. Wunderlich used a bulky thermometer nearly a foot long. It was placed in the axilla and allowed to remain there twenty to twenty-five minutes. The reading had to be made before it was removed. Clinical thermometers of this type were so clumsy that they were carried under the arm Brunton says "as one might carry a gun." The convenient pocket thermometer now in use was the invention of Clifford Allbutt (1868). "Neither Keen nor Tyson saw a clinical thermometer or a hypodermic syringe during 1862-65. Billings, however, in taking care of the wounded from the seven days before Richmond (1865) had provided himself with both" (Garrison).

By the middle of the last century it must have seemed to many clinical investigators that there were no common diseases left undiscovered or at least none that could be recognized by observation alone. In Germany clinical observation became subservient to pathological histology and to experimental physiology. These new factors of research were important, but they yielded relatively little to the development of clinical diagnosis.

In every chronic hospital were patients classed with the paralytics whom the slightest blow would upset, who could not walk without assistance, who let things fall from their grasp and who swayed to and fro when they stood unsupported. Every physician examining such patients assumed that their muscles were weak, or in other words, that they were paralyzed, until Duchenne in Paris found that these apparently weak patients had undim-

\*A crude thermometer was invented by Galileo about 1595. No use was made of it in medicine. Such was the want of knowledge of the significance of changes of body heat that even after the thermometer gained precision it had no practical value in medical diagnosis. In 1749, Martine, an Englishman, published a book on the thermometer that ought to have had an immense influence as it is a "wonder of able observations" (S. Weir Mitchell). It failed, however, to have any appreciable effect on clinical medicine.

inished muscular power and that the real trouble was an inability to coördinate the muscular movements of the arms and legs. The disease he had discovered was called by him progressive locomotor ataxia. This investigator was aided in his work by the use of the faradic current, the value of which in the diagnosis of nervous disease he was the first to recognize. This aided him undoubtedly to see with his eye and to perceive with his brain clinical conditions that had been unnoticed by anyone before him. Duchenne moved from Boulogne to Paris in 1842 carrying with him "his beloved battery—the key which was to unlock for him the door to fame" (A. Keith). He worked there unceasingly for 30 years. He studied cases in all the hospitals of Paris. To do this he renounced the honor of an official position on the staff of any hospital in order that he might devote himself as fully as possible to his researches. "All he desired was access to the clinical fields of Paris and permission to glean as best he could, behind the band of appointed harvesters" (A. Keith). "Ought it to be a subject of reproach to me," Duchenne said, "that I have disinterestedly followed science solely for the love of it." Among the other important diseases he discovered were progressive muscular atrophy, labiolaryngeal paralysis and pseudo-hypertrophic muscular dystrophy.

Schönlein of Berlin was the first to apply the microscope to clinical diagnosis (1836). Its use was extended a few years later by J. Hughes Bennett of Edinburgh (1841). Bennett saw clearly that medicine was to be advanced only by "the rigid observance of the facts of disease and by the careful recording of these facts and he foresaw what wonderful aid the microscope would give to the finding of facts not otherwise discoverable" (W. W. Johnston). He was the first to describe a case of leukaemia (Oct. 1846) and to picture the microscopic appearance of the blood in that disease. The microscope began to be used extensively in studying the urinary sediments about 1850. Frierich's book on "Bright's Disease" published in 1851 contained excellent drawings of tube casts.

In the late seventies Ehrlich discovered methods of preparing fixed films of blood and of staining the leucocytes and red corpuscles. From that time onward the diagnosis of blood diseases rapidly developed. Instruments were soon devised for counting the red corpuscles and leucocytes, and for estimating the percentage of haemoglobin.

The work of Pasteur and Koch in bacteriology made a new and more satisfactory diagnosis possible. In the case of some of the chief infectious diseases that afflict mankind, the cause was discovered. It then became possible to make an etiological or specific diagnosis in cases of pulmonary tuberculosis, typhoid fever and diphtheria, and other less common

diseases. Koch discovered the tubercle bacillus in 1881. By a relatively simple staining method this micro-organism could readily be found in the sputa of consumptive patients. Instead of an anatomical diagnosis such as catarrh of the apex of the lung it was possible to say definitely that the patient has tuberculosis of the lungs as tubercle bacilli have been found in the sputum. Swabs made from a diphtheritic sore throat and smeared over the surface of a tube containing coagulated blood serum gave a growth of diphtheria bacilli in twelve hours. Typhoid bacilli were recovered from the excreta. In 1906 Conradi showed that the presence of typhoid bacilli could be demonstrated in the blood during the first week of typhoid fever by the use of culture media containing ox bile. The use of bile as an aid in growing typhoid bacilli from the blood made possible an earlier diagnosis of the disease. It is now claimed that typhoid bacilli can be recovered from the blood from the very day of the onset of fever to its termination (Schottmüller).

In 1905 Schaudinn and Hoffmann discovered that syphilis was due to a spirochete which they had discovered and named *spirochaeta pallida*. It can be readily demonstrated in the secretion from a primary sore by using a dark field apparatus with the microscope.

The new science of immunology has enriched clinical diagnosis. Typhoid fever and syphilis can be diagnosed from changes in the blood. Infection with tubercle bacilli makes the skin react in a peculiar way when a little tuberculin is rubbed into it (von Pirquet test). Tuberculin is the name given to toxic substances produced by the growth of tubercle bacilli in broth. Susceptibility to diphtheria and scarlet fever are indicated by simple skin reactions—the Schick test for diphtheria and the Dick test for scarlet fever.

Oliver Wendell Holmes says somewhere that with the stethoscope one could see into the chest. He little dreamed that the time would come when the human eye could literally see the interior of the chest, watch the movements of the heart and lungs and observe changes in their structure. Moritz in 1902 devised a radioscopic apparatus (orthodiagraph) that enabled the size of the heart to be measured. It was soon found that the heart differed in shape as well as size in different diseased conditions of that organ.

By mixing with food substances opaque to the X-ray changes in the outline of the stomach and intestines could be seen and through a fluoroscopic screen their movements watched. This was first done on animals by Dr. Walter B. Cannon, the present professor of physiology at Harvard. By this method it is possible to recognize the presence of tumors and ulcers in the digestive organs. The gall bladder can be made visible to the X-ray by injecting certain

compounds of phenolphthalein into the circulation as was first shown by Graham and Cole of St. Louis in 1924, and thereby disease of this organ can be more accurately diagnosed.

Helmholtz invented the ophthalmoscope in 1851. This made possible the study of early degeneration of the blood vessels, and of changes in the optic nerve, and other parts of the retina. It was almost like looking into the brain. Manuel Garcia, a singing teacher of London, discovered the laryngoscope in 1855. The use of reflecting mirrors illuminated by small lights has made it possible to examine the ear and nose, the stomach, the bronchi, the urinary bladder and the lower portion of the intestine. Recently Jacobaeus of Stockholm has used the same method for examining the interior of the abdomen—the peritoneal cavity, and the interior of the chest—the pleural cavity. By means of a trocar a small opening is made in the wall. This is done quite painlessly with the aid of a local anaesthetic. Then a slender endoscope is inserted and the surface of the lung, liver or other structure thought to be the seat of disease brought into view.

The removal of fluid from the chest for determining the character and also for the examination of cells and bacteria that it might contain, has been a common diagnostic procedure for many years. This is done by means of a small glass syringe to which a hollow needle is attached. Quinke of Kiel introduced lumbar puncture in 1895. He showed that cerebrospinal fluid could be easily removed by inserting a long hollow needle between the lower lumbar vertebrae. Examination of this fluid thus obtained has been of great aid in the diagnosis of inflammatory diseases of the nervous system. Dr. James B. Ayer of Boston has found that puncture of the cisterna magna, a natural receptacle for fluid at the base of the brain, gives information of value and when combined with lumbar puncture makes possible the early diagnosis of tumors of the spinal cord.

The sphygmograph, an instrument for recording the arterial pulse, was first constructed by K. Vierordt in 1855 and improved by Marie, a French physiologist in 1860. It was used by many clinicians, but was at length found to be of very little aid in diagnosis and finally was discarded as a "physiological toy." After many years, James Mackenzie, of Burnley, England, found that the despised sphygmograph yielded information of great value if one knew how to interpret the pulse tracings that it made. The form of the pulse wave as traced by the sphygmograph was of little or no use, but in timing events in the cardiac cycle the instrument was of great value. As Mackenzie once said: No one would condemn the handsaw because it is not a good instrument for shaving and so no one should condemn the sphygmograph because the significance of the records it

makes has been wrongly interpreted. In 1901 Mackenzie devised the clinical polygraph which gives simultaneous tracings of the jugular and radial pulse. With the aid of this instrument he was able to recognize the different forms of cardiac irregularity. He showed that some were without significance and that others indicated serious disease of the heart muscle. Mackenzie clearly described the clinical condition or disease associated with an absolutely irregular pulse and called by him nodal rhythm, but which Thomas Lewis and also Rothberger and Winterberg later showed was due to fibrillation of the auricles.

Before Mackenzie's time physicians simply noted that the heart action was irregular and intermittent, but what the irregularity signified was unknown. The aid furnished by pulse tracings when correctly interpreted so cleared up this terra incognita of the arrhythmias that it is possible now by simple clinical methods of palpation and auscultation to recognize in most instances the nature of the irregularity of the pulse.

The life of Mackenzie is like a scientific romance. He was a busy general practitioner in a provincial town with scarcely 15 minutes, he tells us, of uninterrupted leisure for writing. Yet Mackenzie, in the course of 20 years, made such solid contributions to the knowledge of heart disease that he became recognized as leading authority on the subject throughout the world. In the discovery of the clinical significance of radial pulse tracings the observations of Wenckebach of Groningen, Holland, were of great importance, and to the use he made of graphic methods in diagnosis modern cardiology owes a great debt.

Knowledge of disturbances of the cardiac mechanism was further advanced by the use of the string galvanometer invented by Einthoven of Leyden in 1902. So delicate is this instrument that the feeble action current generated by the heart muscle in contracting causes the string to deviate. The movements of the string are magnified and photographed on a moving plate or film. These are called electrocardiograms. They usually reveal more clearly than do pulse tracings the different forms of irregularity of the heart's action. By the aid of the electrocardiogram it has been possible in certain cases to locate areas of disease in a definite part of the right or left ventricle.

Von Basch invented an apparatus for determining the arterial blood pressure in 1881, but credit for introducing this valuable procedure into general use belongs to Riva-Rocci who brought out his instrument in 1896. The auscultatory method of estimating the diastolic blood pressure which is both simple and accurate was discovered by Korotkow in 1905.

F. Müller and Magnus-Levy (1893-1895) discovered that one of the most characteristic phenomena of hyperthyroidism is an increase

in general metabolism while in hypothyroidism (myxoedema) there is a diminished metabolism. Du Bois of New York was the first to study metabolism in exophthalmic goitre by means of a respiration apparatus, which was also a calorimeter. He showed that measurement of heat production gave the best index of the severity of the disease. Severe cases had a heat production of 50 per cent or more above the normal. Within the last eight years these discoveries have been utilized in clinical diagnosis, and at the present time the basal metabolism is determined in all well equipped clinics and hospitals in cases of suspected disease of the thyroid gland. This was made possible by the invention of a simple type of respiration apparatus for indirect calorimetry by F. G. Benedict of Boston.

In the diagnosis of nervous states the importance of a full and accurate history of the inner life of the patient has only recently been recognized. Hence the anamnesis, that is the history of the case, has become of greater aid in diagnosis than ever before. That physical pain may be of psychic origin was known to Plato as is shown from the following incident narrated in the Dialogues. When the youth Charmides besought Socrates to cure him of his headache, Socrates replied that he would not attempt to cure the headache unless Charmides first allowed him to cure his soul. "For this," said Socrates, "is the great error of our day in the treatment of the human body, that physicians separate the soul from the body."

Physicians in all ages have spent much of their time listening to the complaints of patients who show no evidence of any organic disease. This class of sufferers present a great variety of symptoms and many names have been given to these functional disorders. In former times if the patient was sad the disorder was called melancholia, if apprehensive about himself the condition was termed hypochondria, or if there were convulsions or other paroxysmal manifestations it was diagnosed hysteria. When distress or pain were confined to one part of the body the diagnosis was simple. It consisted of attaching the Greek word for pain to the part of the body affected. Thus it was cephalalgia if the pain was in the head, or coccyalgia if at the tip of the spine. Sydenham realized that in hysteria there might be severe pains in any part of the body. The psychic origin of hypochondria was not always recognized even by the pioneers in mental hygiene and therapeutics. Von Feuchtersleben, the author of the classical *Diätetik der Seele*—the Dietetics of the Soul—attributed, for example, the hypochondria from which Kant suffered to the fact that he was flat-chested!

No unity was apparent behind the diversity of symptoms even after the functional nature of the disorders was recognized. If a patient had cardiac symptoms of nervous origin it was

called a cardiac neurosis, if the symptoms affected the stomach a gastric neurosis, if the pains were general throughout the body a neuralgia or a myalgia. George Beard, the American, invented a new name, neurasthenia, for a disease as old as Greek medicine, but he had no realization of its true nature. Walter Channing of Boston in 1860 published a remarkable paper on a severe type of functional nervous disorder in which the patient remained bedridden for years. Any attempt to leave the bed produced pain and exhaustion. This condition he termed the Bed Case. It was evidently not uncommon in his experience. He recognized most clearly the true origin of the disease. "It is moral in its cause," he says, "wholly moral. The evidence of this which has been furnished to me, is as large as has been the basis of assent in any of my professional engagements. My mind has been in many cases wholly made up by this evidence, and the mode of their termination has shown the correctness of the judgment." No credit so far as I know has been given to Channing for this discovery. His bed case would now be classed as a severe form of neurasthenia. Bernheim of Nancy was possibly the first to recognize that hysteria was a disorder of the moral life. Even the great Charcot had insisted that it was due to a physical condition. Although Janet recognized that nervous states were of emotional origin, the correct conception of neurasthenia and the other neuroses remained vague until the work of P. Dubois of Berne, Switzerland. He showed that these functional disorders embraced under the terms, hysteria, hypochondria, neurasthenia and neurosis, are all of psychic origin. Dubois proposed the term psychoneuroses for this group of nervous disorders. He recognized that they are really psychoses. The longer word has its advantages because it separates nervous states "from the properly called insanities, while at the same time indicating the psychic nature of the trouble. The second part of the word indicated those functional nervous troubles which accompany the psychopathic state."

The truth so clearly shown by Dubois that back of the common nervous disorders is a psychic disturbance has been of the greatest aid in medical diagnosis. It has led to more detailed case histories which now include as careful a scrutiny into the shocks and strains in the patient's emotional life as into the accidents and diseases of his body.

The development of functional diagnosis is one of the important advances in modern medicine. Disease as it manifests itself in sick people is a disturbance in function and as long as physicians saw and thought anatomically and not physiologically they could not really understand the true nature of the trouble in the human machine that made the patient seek help from the doctor. Leube, as early as 1871,



proposed that the digestive action of the stomach should be tested by giving various foods and then removing the stomach contents from time to time to note the degree of digestion and the motor power of the organ. In 1885, Ewald and his pupil, Boas, devised the simple test meal which is still used. It had before this been shown by workers in Kussmaul's clinic that the hydrochloric acid occurred both in a free and in a combined state in the stomach (Szabo) and that in cancer of the stomach free hydrochloric acid was absent. A test diet for the diagnosis of intestinal disease was devised by Adolph Schmidt. This has proved to be a distinct aid in the study of intestinal function especially in determining the extent of the digestion of food in the intestine and its absorption. As Faber has recently pointed out, it was O. Rosenbach, "a true child of German physiological medicine," who first recognized the importance of the functional diagnosis of disease. In its development he saw an escape from the domination of the anatomical school which looked upon disease only as alteration in the structure of organs. Rosenbach hoped that disease might be recognized by functional methods and cured before permanent organic changes in the tissues had occurred. Unfortunately this hope was not realized.

It was Rosenbach who discovered the remarkable capacity of the heart to meet increased demands with ease. This he called the reserve power of the heart muscle. Its existence was demonstrated strikingly by an experiment. The aortic valve of a dog was torn so that marked insufficiency at the aortic orifice resulted. To Rosenbach's surprise the heart continued to do its work as well as before the injury. Years later the nature of this reserve power was shown by O. Frank in his studies on the dynamics of the heart. Mackenzie has emphasized recently what Rosenbach saw so clearly that the main problem for the physician to solve in every case of heart disease is not the anatomical change in the valves or heart muscle, but the heart's ability to do its work. In spite of many attempts no satisfactory method has been found for measuring accurately the power of the heart. An indirect measure of the reserve power of the heart is furnished by the so called vital capacity of the lungs as Peabody of Boston has recently shown. The spirometer with which the measurements are made was invented by John Hutchinson of England, whose valuable studies on vital capacity appeared as long ago as 1846.

Functional diagnosis in relation to kidney disease has been developed during the past twenty-five years. Von Koranyi, as early as 1897, measured the power of the kidneys to increase the molecular concentration of the urine by means of cryoseopy (determination of the freezing point). Schlayer introduced a test diet and examined the urine every two hours the

day the diet was given. Rowntree and Geraghty working in Abel's laboratory at Johns Hopkins introduced the use of phenolsulphonaphthalein as a renal test. They estimated the percentage of this dye which is excreted in two hours and found it was lowered according to the degree the kidneys were damaged. The ability of the kidneys to dilute and to concentrate the urine is easily determined by the water test. This was first proposed by Hansen and Groendahl in Norway in 1903. It was brought into general use in Germany through the work of Volhard and Fahr in 1914. Later the technique was improved by Strauss. It is a simple, valuable functional test and will undoubtedly soon be extensively employed in this country.

The micro-chemical methods of blood analysis developed especially by Folin of Boston, Bang of Copenhagen and Stanley Benedict of New York have been of great assistance in the study of diabetes, gout and kidney insufficiency. The beginning of the chemical analysis of the blood in disease dates back many years. In Bright's second paper published in 1836 he reported that in severe nephritis Babington had found the urea in the blood greatly increased, and Garrod in 1846 demonstrated an increase of uric acid in the blood of gouty patients.

The development of functional diagnosis has brought clinical medicine and experimental physiology into closer contact. Due to the advance in knowledge in both of these domains it has been possible to utilize discoveries made in the laboratory without delay in the diagnosis of diseases. A good illustration of this is furnished in the discovery of a new method of studying disease of the liver and gall bladder. Meltzer by experiments on animals found that a solution of magnesium sulphate applied to the orifice of the common bile duct in the duodenum caused a flow of bile. Lyons of Philadelphia on the basis of this discovery in the laboratory, developed a clinical method of obtaining bile from the duodenum for examination. He was able to do this with the aid of a duodenal tube, the invention of Einhorn of New York. It has been found possible in this way to diagnose with greater accuracy inflammatory disease of the gall bladder.

It was recognized early in the last century by some that the study of physiology and the study of clinical medicine were closely related and that disease presents itself in a sick man as a physiological disturbance; or in other words the work of the practising physician deals with problems in pathological physiology. Marshall Hall over 75 years ago expressed this view clearly when he said: "To become good and enlightened practitioners, we must become able physiologists." But at that time there was little discovered in the laboratory that could be utilized in the study of disease at the bedside. The period of functional diagnosis with its in-

tensified study by means of physiological methods of research has helped to break down the barriers which formerly existed between the experimental and the clinical branches of medicine. The old demand for the same scientific accuracy of method and reasoning in clinical research, as is required in the experimental institute has now been universally recognized and appreciated (Faber). The introduction of functional tests into clinical medicine brought the experimental method from the laboratory to the hospital wards. An experiment according to the definition of Claude Bernard is *une observation provoquée*. Hence in the proper employment of this method the trained faculty of observation is as essential as in the days of Hippocrates.

The spirit of Louis with its emphasis on accuracy and thoroughness of observation at the bedside was instilled into American medicine by his pupils in the second quarter of the last century. Their successors, however, who

knew not Louis, failed to maintain the high standard of their fathers. In spite of the efforts of individual physicians, notably Austin Flint, clinical medicine throughout America was at a low state when William Osler began his work in Philadelphia in 1885. He brought the haven of science to the bedside and in his life and in his teaching was true to the Hippocratic ideals. His influence on the development of medical diagnosis in this country was greater than that of any other man, and it still lives. The lesson he taught by his life, was the one he ascribed to his friend in spirit, Sir Thomas Browne, whose writings he made his constant companion from early youth:—"Mastery of self, conscientious devotion to duty, but human interest in human beings." Osler recognized that "in the faculty of observation the old Greeks were our masters," and that we must return to this method if we are to continue the progress already made.

## VACCINATION AGAINST SMALLPOX\*

### Its Technic and Interpretation

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SUCCESSFUL vaccination against smallpox depends upon three main factors, which are, the integrity of the vaccine, the technic of vaccination, and the interpretation of the reactions resulting from the operation. In spite of the detailed directions supplied by all manufacturers with each package of vaccine virus, there still exists a considerable misuse of this delicate biologic agent; in spite of recent improvements in the operation of vaccination, old-fashioned, undesirable and unnecessary methods are frequently employed; and, furthermore there exists much confusion, and often ignorance, concerning the failures, the various immune reactions and accelerated "takes" following vaccination.

It has been suggested that on account of the growing interest in vaccination and the increased importance of the practice, a detailed discussion of these three factors be presented in the hope that a simple and satisfactory method of vaccination might be more generally adopted and that greater attention might be given to variations in vaccinal reactions. The chief purpose of this article, therefore, is to promote a method of vaccination which will result in a greater degree of protection against smallpox with the least annoyance to the persons vaccinated.

#### I. THE VACCINE VIRUS

Vaccine virus prepared by the various establishments in this country is produced under

\*Read at the meeting of the Massachusetts Association of Boards of Health, July 30, 1925.

the supervision of the United States Public Health Service and must conform in every respect to Federal regulations. The product contains the living virus of *vaccinia* or *cowpox* in a diluent containing 50 per cent. glycerine and approximately one-half of one per cent. phenol. The virus, being a living one, is susceptible to any degree of heat above refrigerator temperature and this susceptibility is greatly increased, when the temperature rises, by the germicidal action of the phenol. On account of this delicate viability care must be taken to keep the vaccine continuously in a cold place—the colder the better. It is best to keep the package of vaccine in contact with the ice in a refrigerator from the time of its receipt until just before it is to be used. Even when kept under such conditions vaccine virus should be expected to remain potent and give satisfactory "takes" only until the expiration date stamped on each package. The best results are obtained with fresh virus kept cold until the time of use. A record should be made of the name of the manufacturer and of the lot number stamped on the package.

#### II. THE VACCINATION SITE

The best place to vaccinate is the skin on the left arm (in right-handed persons) over the insertion of the deltoid muscle. This site is subject to less irritation, to less hypostatic congestion and less constriction from the clothing, and is exposed less, as a rule, to street dust than is the leg. The improved methods leave scars so

small and so superficial that they are rarely unsightly.

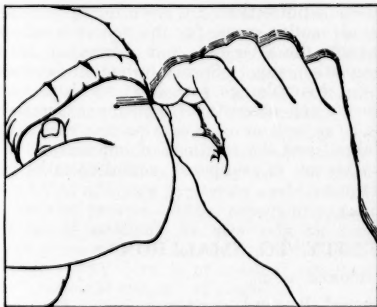
### III. METHOD OF VACCINATION

#### A. Preparation of the Skin

The skin is washed thoroughly with soap and warm water, dried with sterile gauze or cotton, then with acetone or ether and allowed to dry. No medicated or denatured alcohol, iodine or any germicides should be used because they are apt to kill the vaccine virus and prevent successful "takes."

#### B. The Operation of Vaccination

The tube of vaccine virus is opened under aseptic precautions and a drop of vaccine placed on the arm. Hold the arm horizontal with the skin made taut by grasping the arm from below with the left hand. Hold a sharp sterile needle parallel to the skin, with the fore and middle fingers of the right hand above the needle and the thumb below, the needle pointing to the operator's left. The side of the needle point is then pressed into the drop about 30 times, the needle being lifted clear of the skin each time. The motion should be quite perpendicular to the skin and needle with the needle held constantly horizontal to the skin. In this way the elasticity of the skin will pull a minute portion of the epidermis over the point of the needle at each pressure. *The total area should never be greater than one-eighth inch in diameter and should not be deep enough to bleed.* Immediately after these superficial pricks have been made the remaining virus is wiped off the skin with sterile gauze and the sleeve is pulled down. Keep the vaccinated area dry and clean. Avoid undue exertion and any unnecessary irritation of the arm.



If this technic is carefully practiced a superficial inoculation will take place and the vaccination will run a typical course, resulting in a small scar.

This method causes little or no discomfort to the patient, gives a high percentage of "takes" and is the one early used by Kinyoun and now

advocated by the United States Public Health Service and other authorities.

There are, of course, other methods which, when properly used, may give a successful vaccination but with these older methods it can not be too strongly emphasized that the sacrifice whether by scratch, puncture or drill should be *superficial* and that the *greatest dimension of any area scarified should not exceed one-eighth inch.* There is no longer reason to believe that the degree of immunity produced is proportional to the number or size of the vaccine insertions. While the intradermic method by injection may give satisfactory results in expert hands, it is not to be recommended, and the subcutaneous method, the older methods of cross-hatching, incision, deep puncture or abrasion should be entirely abandoned.

#### C. Care of the Vaccinated Site

No dressings are necessary and under no circumstances should shields of any sort be used. If, by accident the vesicle, pustule or crust be broken, the skin scratched or the vaccination site injured in any way, the arm should be treated by such measures as are appropriate for the condition and a loose dressing of a few layers of sterile gauze may be applied but should always be changed daily.

### IV. OBSERVATION OF THE VACCINATED SITE

Let it be said here that so far as can be determined there are no persons naturally immune to smallpox or vaccinia unless they have had smallpox, and therefore every person properly vaccinated must develop a typical "take," in a primary vaccination or a typical "take," an accelerated "take" or an immediate reaction in a subsequent vaccination. Even a person who has had smallpox or has been successfully vaccinated must show in some degree one of these three types of reaction.

*With a first vaccination, therefore, if the person vaccinated (excluding those persons who have previously had smallpox) fails to develop a typical "take" the fault lies either with the vaccine or the vaccinator. In such a case the operation should be repeated using a different and fresh lot of vaccine virus and eliminating any possible technical faults which may have contributed to the failure, until either a typical "take" or an accelerated or immune reaction is obtained.*

In the case of primary vaccinations the site should be inspected preferably on the fifth, seventh and ninth day, but always on the seventh, eighth or ninth day. If the person has been previously vaccinated, or has previously had smallpox, the arm should be examined on the second or third day for an immediate or immune reaction and on the fifth day for an accelerated "take," and if neither of these reactions appears, the arm should be observed on the seventh to ninth day.

## V. VACCINAL REACTIONS

The reactions following vaccination are so well described by Leake (Leake, J. P.: The immunity following smallpox vaccination. The Military Surgeon, December, 1923) that his description is quoted here. "In the usual previously non-immunized person the site of vaccination begins to redden for a millimeter or two around the insertion in about three days and shows its central part raised with a red surrounding zone of 2 or 3 millimeters in a day or two more. In this central part there develops by the fifth to seventh day an exudate which gives a grayish color to this vesicle or pustule. On about the seventh day the surrounding red zone suddenly begins a rapid spread, reaching its largest diameter eight to eleven days after vaccination, and it is this wide-spreading area, rather than the vesicle or pustule, that constitutes the most significant part of the process. A crust has meanwhile begun to form on the vesicle, and within a few hours after the greatest spread of the area has been reached the color becomes somewhat duller and a gradual fading of the area commences.

"The changes from this picture when the subject, instead of being vaccinated for the first time, has already acquired some immunity, are in the direction of a hastening of the process and a lessening of its intensity. If the immunity is only moderate the first appearance of a "take" will be a day or two earlier, but the same course of papule, vesicle and area production will be followed, reaching its height three to seven days after vaccination. This has been called the accelerated reaction, or vaccinoid.

"If the immunity is very high, vaccination will result only in the rapid production of the first stages of the process usually without vesicle or true area formation, the redness and induration being greatest in twelve to seventy-two hours after insertion. It is the day of greatest extent of the redness which is the important criterion in differentiating these different reactions. This last, the mildest form of "take" is called the immediate reaction, or the reaction of immunity.

"In general, the more recent the first vaccination the closer will the reaction after the revaccination approximate that last described,

but individuals vary in the rate at which the immunity is lost, and the reaction will also vary with the potency of the virus used. To interpret these rapid and fleeting reactions as indicating substantial immunity a virus must be used which will give approximately 100 per cent success in primary vaccination."

## IV. WHEN TO VACCINATE

Children should always be vaccinated in the first year of life, preferably during the second six months, and again at the time of entering school (5th or 6th year). Revaccinations should always be done if exposure has taken place or is likely. It is a good general rule to vaccinate every five years, and a still better rule to revaccinate until an immediate or immune reaction is obtained. This latter rule should be applied to all health officers, physicians and the personnel of hospitals and institutions for the care of children, the aged, feeble-minded, insane and prisoners. All new arrivals at such institutions should be vaccinated upon or soon after admission. All private schools and colleges should demand reliable evidence of a recent successful vaccination as a requisite for entrance.

## VII. CONTRAINDICATIONS

Recent experience has shown that too much importance has been ascribed to many supposed contraindications to vaccination. During a recent epidemic of virulent smallpox, in a series of vaccinations on over 3300 hospital patients suffering at the time from various ailments including diphtheria, scarlet fever, tuberculosis, measles, mumps, whooping cough, erysipelas, poliomyelitis, pregnancy and recent parturition, there were no untoward results.

## SUMMARY

Detailed directions are given for the care and use of vaccine virus, for the operation of vaccination, the after care and observation of the vaccination site. Special attention is drawn to the desirable age periods at which to vaccinate, to the necessity of securing a successful result as well as of observing the accelerated "takes" and the reactions of immunity. The importance of supposed contraindications is minimized.

## THE SKIN TEST FOR IMMUNITY TO SMALLPOX\*

BY SANFORD BURTON HOOKER, M. D.

[From the Evans Memorial, Boston.]

THE ordinary procedure of vaccination against smallpox affords both a method of immunization and a measure of existing immunity.

That vaccination serves these two purposes was clearly recognized by Jenner in his mono-

graph published in 1798. He wrote "It is remarkable that variolous matter, when the system is disposed to reject it, should excite inflammation on the part to which it is applied more speedily than when it produces smallpox. Indeed, it becomes almost a criterion by which we can determine whether the infection will be re-

\*Read at the meeting of the Massachusetts Association of Boards of Health, July 30, 1925.



ceived or not. It seems as if a change which endures through life had been produced in the action or disposition to action in the vessels of the skin; and it is remarkable too, that whether this change has been effected by the smallpox or the cowpox, that the disposition to sudden cuticular inflammation is the same on the application of variolous matter." These astute observations were made in a report of his failure to inoculate with cowpox fourteen persons who had previously had smallpox. He also records the sudden appearance of an "efflorescence of a palish red color" at the site where variolous matter had been inserted in a woman who had had cowpox thirty-one years previously.

More than a century later von Pirquet, in collaboration with Schick, considerably amplified these observations and pointed out the chronologic similarity of the various vaccinal reactions to those which follow injections of foreign serum in individuals possessing different degrees of hypersensitiveness. Jenner's "sudden cuticular inflammation" was translated into the "immediate reaction," and a form of modified vaccinia—since called "vaccinoid"—was brought into parallel relation with the "accelerated" type of serum sickness.

Force, since 1913, and recently some members of the United States Public Health Service, have worked to popularize this knowledge, but no general recognition of the significance of these reactions to cowpox virus has become established in the medical profession at large. The following statement seems timely at this threatening stage of our unenviable smallpox situation in the United States, and is prepared with the hope that it may help to show that vaccination is something to be desired, not avoided, for in no other way can absolute community protection be achieved.

It is a general truth, to which there are but scattered exceptions, that vaccination protects against smallpox and against itself. There is some statistical evidence that immunity to smallpox under conditions of natural exposure is greater than immunity to vaccination. It follows clearly, then, that when immunity to cowpox has been produced, and demonstrated by the test of revaccination, we may feel the more assured that adequate protection against smallpox is likewise present. Thus, expediently, for the control of smallpox we may rely on vaccine virus as our material for the production and test of immunity; there is no need of resorting to the "variolous matter" of Jenner.

Among an unselected population there exist, of course, all gradations between frank susceptibility and a high degree of immunity to the virus. In order to simplify classification and record, however, it has become customary to make use of only three groups, namely: (1) not immune, (2) partially immune, (3) immune. Following vaccination of such groups these cor-

responding reactions develop: (1) vaccinia, (2) vaccinoid, (3) reaction of immunity.

#### VACCINIA

This type of reaction needs no description further than to say that it is the typical "take" or "successful vaccination." It indicates a *lack of immunity* and develops after primary vaccination of individuals who have never had smallpox. It also occurs in a considerable proportion of subjects who had their first vaccination, or, more rarely, their attack of smallpox, many years previously. With the attainment of the maximal extent of the areola, about the tenth day, immunity is established and endures for a variable period; it may be lost, as in at least one instance, within eight months, or it may last throughout life; perhaps five to seven years is the average limit of its effectiveness. Primary vaccinia is very much more likely to be accompanied by constitutional disturbance in adults than in children. This constitutes an additional argument for vaccination early in life.

#### VACCINOID

This "accelerated reaction" is an abortive form of vaccinia which indicates the continued existence of *partial (declining) immunity* derived from a previous vaccination or varola. A small papule appears after two or three days; the height of the local disturbance is reached on about the sixth day, then it rapidly subsides. The vesicle is small and the pustule may not develop; consequently the scar, if any, is tiny and shallow. Even the slightest systemic disturbance is rare. Immunity is reestablished and is commonly maintained for a period longer than that which follows primary vaccinia. Indeed, a large proportion of persons who have had two vaccinia reactions or vaccinia followed by vaccinoid are protected for life.

Smallpox occurring in a partially immune person takes the mild "varioid" form.

#### REACTION OF IMMUNITY

This "immediate reaction" is the extremely important type concerning which the lack of information is so general. Failure to inspect the vaccinated site at the time when this reaction manifests itself is responsible for a great deal of futile revaccination and groundless complaint of inert virus. Observation and proper interpretation of this type of reaction will do much to conserve time and material, to simplify administrative control, and to enhance public appreciation of the desirability of smallpox immunization.

The reaction of immunity occurs in persons who still maintain in high degree the protection conferred by previous (usually recent) vaccination or previous attack of smallpox. It attains maximal size in 48 hours or less and appears as a

small area of reddened induration at the traumatized site with a variable zone of surrounding erythema. Itching is common. Frequently the resemblance to a circumscribed patch of goose-flesh is striking. The diameter of the reaction may range from 4 to 40 millimeters. In order to interpret these mild reactions with greater certainty it is always desirable to prepare a control site in precisely the same manner as that which is treated with the virus. Preferably it should be made at the corresponding area on the other arm where chance infection with unabsorbed virus will be minimized. The New York Quarantine Station records four grades of reaction:

- + One in which there is slightly more swelling and redness in the vaccination scratch than in the control.
- ++ A definite reaction as compared with control.
- +++ Marked reaction as compared with control.
- ++++ Very well marked reaction as compared with control.

The Station does not accept a "+" reaction either for release or issue of certificate of immunity. The reaction must be definite. In order to observe these reactions, which are sometimes very fleeting, it is desirable to examine at the end of 12, 24, 36, and 48 hours. After failure to produce any type of reaction, revaccinate with new virus and observe every two hours if possible. Even these minimal responses may serve to increase the already existing immunity.

The "immediate" reaction may be elicited by dead virus, but it is safest to depend only on reactions evoked by a virus which is producing 100 per cent. "takes" in primary vaccinations. Sometimes a "green"—unripened and extremely potent—virus will produce a vaccinoid response in an individual who develops only an immediate reaction to the safer glycerolated vaccine. Green virus has a much higher bacterial content and it is likely that its apparently greater aggressiveness is ascribable to some circumstance of symbiosis. Green virus is objectionable in that primary takes are more severe; its use is probably unwarranted save possibly in the presence of alarming epidemic conditions.

With proper technique and a potent virus the reaction of immunity evidences an eminently successful vaccination, and the existence of a high degree of resistance to smallpox.

Several of the ideas expressed and implied in the preceding paragraphs merit the additional emphasis afforded by association and rephrasing.

The time of appearance of the maximal local reaction following vaccination measures the person's immunity to smallpox; the earlier the reaction the greater the immunity; the later reactions denote the greater susceptibility. Early responses are slight and the later more severe. The significant feature of the reaction from the

immunological standpoint is the areola; the day of its greatest development marks the time when the body has formed and mobilized an effective concentration of antibodies leading to digestion of the virus. In general, the more distant the previous vaccination the later will be the response to revaccination. In other words, the further the clock has run down the longer it takes to wind it up.

Vaccination has certain limitations. Failure to recognize that one successful vaccination does not necessarily confer absolute and permanent immunity against smallpox has done harm by enabling the enemies of medical progress to create distrust in the minds of the uninformed by stressing individual instances of failure. Thorough revaccination is essential to protect the individual and the community; it is particularly necessitated when the virulent hemorrhagic type of smallpox is imminent.

Revaccination is the term used here because these remarks are addressed to a medical audience. However, when carrying out our duty of acquainting the entire community with the present necessity for adequate protection against smallpox, it is urged that we emphasize the idea of the test for immunity. "Have your immunity to smallpox tested!" seems immensely superior to "Be vaccinated!" as an exhortation designed to overcome public inertia. Stress the mild character of the reactions: "If you are immune it will not 'take' (in the popular sense); if you are not, the test itself will remedy that defect."

#### SUMMARY

The three types of response to vaccination are described: (1) *Vaccinia*, which indicates the absence of immunity, (2) *Vaccinoid*, which signifies partial immunity, and (3) *Reaction of immunity* which is self-explanatory. Attention is drawn to the great importance of this third type.

Public coöperation and education are indispensable; smallpox immunization must be shown to be desirable—not something to be avoided; the profession should not ask for consent, it should receive requests: in working to achieve these desiderata it is urged that we speak not of vaccination and revaccination but of the test for immunity.

#### NEW ALCOHOL DEADLY AS BEVERAGE

GERMAN methanol, now being imported in such quantities as to arouse fear that America's \$100,000,000 wood distillation industry will be wiped out, is dangerous to life, according to Professor Reid Hunt of the Medical School of Harvard University.

Professor Hunt said: "It can confidently be predicted that the use of the synthetic methanol as a beverage or as an adulterant will be followed by the same disastrous effects to life and vision as have characterized such uses of wood alcohol."

## BRONCHIAL PEANUTS AND THEIR PROBLEMS

*From the Oto-laryngological Clinic of the Children's Hospital*

BY LYMAN RICHARDS, M.D., BOSTON, MASS.

THE comparative rarity of non-opaque foreign bodies in the bronchi and the problems sometimes attending diagnosis and removal warrant an account of two such cases operated upon by the author in which unusual complications added further interest and difficulty to the picture.

Non-opaque foreign bodies occur most frequently in children under two years of age, who if not carefully watched will unhesitatingly put any object within easy reach into their mouths. This is particularly true of such food particles as normally require mastication and which they have not yet learned to eat properly. Such is the roasted peanut kernel, either whole or in large fragments, which a careless or ignorant parent either feeds directly to children or allows them to secure and put into their mouths. The same result obtains when candy which contains peanut kernels imbedded in it is fed to a child, the soluble substance being dissolved off and the nut left to be aspirated into the trachea or swallowed as chance determines. The question as to which of these events has taken place is not always a simple matter to determine. Aspiration may occur when no older person is present, initial symptoms of choking and coughing may have entirely subsided before the attention of the parents is attracted. Nothing further may point to this event as the cause of a subsequent cough, expectoration, wheezing, or fever. For this reason a positive or negative history of aspiration in these children is very unreliable and undue emphasis cannot be placed upon it.

In such a case every effort must be made to eliminate the possibility of foreign body in all cases of obscure pulmonary pathology in children, and the closest questioning of the parents and attendants carried out with this in mind. Hence it follows that any lead given by parents which at all suggests a foreign body must be carefully followed up by the physician to whom the patient is first brought. Strangely enough it frequently happens that a perfectly definite possibility of aspiration is neglected entirely or minimized because the presenting symptoms are so slight and the patient so comfortable that the physician assures the family that a foreign body in the bronchial tree could not possibly exist without more respiratory embarrassment, and that their fears of aspiration are groundless. This results in delay in diagnosis till the parents consult another physician who may be shrewd enough to take their story at its proper valuation, send the patient to a hospital and at least attempt a diagnosis by all possible means. This situation is well exemplified in Case I, where the

child was taken to three physicians all of whom urged the parents to abandon their suspicions that a peanut had been aspirated. They finally consulted a doctor, who at once advised them to have a roentgen ray taken and sent the child to the Children's Hospital with the following note:

"Baby said to have choked with peanut candy five weeks ago. Since then coughing and wheezing. X-ray shows a question of obstruction in the left bronchus." Such a plan may result in a needless stay in the hospital; it may also be a life-saving procedure and is by far the wisest and safest course to pursue.

As above stated it is the mildness of symptoms that tend to make inexperienced men heedless of a suggestive history of foreign body aspiration. One of the characteristic features of non-opaque bodies like peanuts is their production, not only of mechanical obstruction but of a toxic inflammatory reaction of the bronchial walls which makes the obstruction more complete and often adds a general systemic infection with fever and malaise. So far as can be determined this toxic effect said to be due to something in the oil of the peanut kernel was never a prominent feature in either of my cases since at no time could any story of acute illness be elicited. If the kernel is small in relation to the bronchial lumen and so placed as not to cause complete occlusion then the obstructive symptoms will not be particularly severe and hence the merest suspicion and hint of aspiration must be viewed as important. Where no thoroughly acute symptoms appear it is uncertain how long such a foreign body may be carried around before disintegration and a resulting pneumonic infection or abscess call attention to the intruder long after its entire and intact removal might have been accomplished.

Thus it appears that early diagnosis is of the utmost importance. Of the methods most serviceable and most readily at hand are first, physical examination of the chest by a competent internist, and second, roentgen ray examination by an expert roentgenologist. The classical signs of bronchial obstruction with diminished resonance and breath sounds are frequently present if the foreign body is lodged in the main bronchial stem and has been there but a short time. A more prolonged sojourn produces a gradual hyperresonance and tympany as a result of a condition known as obstructive emphysema and now being studied extensively at the Bronchoscopic Clinic in Philadelphia. It results from the fact that at first air can pass by the foreign body into the lung both at inspiration and expiration, but with the gradual de-

velopment of an inflammatory reaction of the bronchial mucous membrane together with the normal expansion of the wall during inspiration, air can finally pass into the lung but is trapped at expiration and cannot get out. The result is a gradually increasing distension of the lung and a final emphysema on the affected side.

Through the X-ray studies of Manges of Philadelphia this condition of obstructive emphysema has been made a highly efficient point in the diagnosis of non-opaque foreign body in the lung. Briefly the method consists in X-raying the chest at the very end of inspiration and expiration. At the end of inspiration all the air possible has entered both lungs and both radiate with essentially equal clarity, but at the end of expiration a very different picture presents. On the normal free side air has been expired and the appearance of the ray is slightly less clear than before, on the pathological side, with the foreign body in the bronchial lumen and the air trapped beyond it, the lung is as clear as at the end of inspiration and the contrast with the normal side is sufficiently marked to be of great aid in diagnosis. Were a single plate taken by chance at the end of expiration without this condition in mind it would be easy to select the normal but distinctly darker side of the plate as the pathological one. It is not always easy to secure pictures of crying children at exactly the end of inspiration and expiration and it requires much practice and experience to interpret the findings accurately. For this reason a clinic where such cases come only at long intervals is at a great disadvantage, and resort must be had to the more difficult but more conclusive procedure of bronchoscopy.

CASE I. The first patient R. B., aged 18 months, was admitted to the Children's Hospital on March 16, 1925, accompanied by his physician's letter quoted above. At this time there was practically no sign of respiratory embarrassment other than a slight expiratory wheeze, heard only with the ear applied closely to the child's mouth. An occasional short croupy cough was present. There was no elevation of temperature, no cyanosis, and the child appeared otherwise perfectly well. Physical examination of the chest showed good and equal expansion as well as unimpaired resonance throughout. Breath sounds were normal and of equal intensity over either lung. Fremitus was slightly increased just inside the left scapula but otherwise the examination showed no evidence whatever of any obstruction in either bronchus. The diagnosis of foreign body was thought by the medical consultant to be unlikely from these signs though it could not be ruled out as an explanation for the slight wheeze and occasional cough.

The report of the first roentgen ray examina-

tion on admission was as follows: "Films of the chest show a definite increase in density in the region of the left hilus and a generalized clouding of the left lung. The right lung is definitely more radiable than normal, apparently as the result of an emphysema which displaces the heart to the left. The right diaphragm is also slightly flattened. The appearance is suggestive of a non-opaque foreign body in the left lung."

This report at once illustrates the difficulties of diagnosis in these cases. If the lodgement of the suspected foreign body had been so recent as to give rise to an obstructive emphysema such as described by Manges, then the above report should have stated that the appearance was that of a foreign body in the right lung. If however the right-sided emphysema noted was of the compensatory type and the result of a complete blockage of the left bronchus and a gradual atelectasis on this side then the diagnosis of a left sided foreign body was entirely justifiable. Such a condition however did not in any way coincide with the findings on physical examination.

The next day preparations were made for a bronchoscopic examination without anesthesia. The larynx was exposed with the child's size Jackson laryngoscope and the glottic opening found to be so narrowed by inflammatory swelling as to make impossible the introduction of even a 4 mm. bronchoscope. It was decided to await the subsidence of this condition with a view to resorting to tracheotomy in case it should increase. This condition of the larynx satisfactorily explained the slight wheeze noted, but no foreign body in the larynx itself was observed. During the next two weeks the ward was quarantined for scarlet fever and further examination was impossible. All symptoms in the meantime entirely disappeared, there was no wheezing and only an occasional cough. An X-ray on March 26th stated that the left-sided density had diminished, but that the right-sided emphysema was still present. It was a great temptation to discharge the patient as having no foreign body, but the history of possible aspiration and the previous appearance of the larynx prompted the author to attempt another bronchoscopy. On March 31, the larynx was again exposed and found to have an almost normal lumen. A 4 mm. plain bronchoscope was easily introduced into the trachea and carried to the bifurcation. Immediately a white irregular object was seen occupying the lumen of the left primary bronchus, obviously a foreign body and probably a peanut kernel. It was apparently moving with respiration and allowing some air to go past it. The foreign body was grasped with the smallest sized side-grasping forceps which were removed together with the bronchoscope. Examination of the fragment in the forceps grasp showed clearly that a portion of the foreign body had broken off and re-



mained in the lung. The piece removed was white in color, about an eighth of an inch in diameter and could readily have been a portion of a peanut kernel, being however much softer and more brittle than a fresh nut. Although the bronchoscopy lasted less than five minutes and nothing untoward developed during it, it was thought best not to reintroduce the bronchoscope lest the laryngeal edema should recur, but to postpone removal of the remaining fragment for a few days. Had it been known at the time of applying the forceps that the piece being removed was not the entire kernel and was of such a size as to pass the lumen of the bronchoscope the forceps could have been withdrawn while leaving the bronchoscope in situ for a second forceps introduction. A positive diagnosis had now been made.

In spite of the fact that the entire nut kernel had caused such slight symptoms for seven weeks its remaining portion proceeded to cause very violent ones, the result probably of dislodgement of the kernel into the trachea, where it was free to move up and down and hence occasion great irritation. Within a few hours after removal of the fragment the child began to have severe paroxysmal attacks of coughing, once with marked cyanosis, suggestive either of the engagement of the foreign body against the under surface of the glottis at the end of forced expiration or against the tracheal bifurcation on forced inspiration. Substernal and epigastric retraction began to make their warning appearance and six hours after the first bronchoscopy a second one was performed. On introducing the bronchoscope into the trachea the remainder of the foreign body was immediately encountered apparently loose in the lower end. It was grasped with forward grasping forceps, drawn up against the lower end of the bronchoscope till definite resistance was felt to indicate that the entire kernel was held by the forceps. Bronchoscope, forceps and foreign body were then withdrawn as a unit. The latter was found to be of the same material as at the previous removal, about 4 mm. in diameter. A definite slot indicated the point of attachment of the first fragment. The bronchoscopy did not last over 3 minutes and the child returned to the ward breathing quietly and perfectly comfortable. There was no further cough or cyanosis and all symptoms of a tracheal foreign body disappeared. In their place however within half an hour appeared the typical signs and symptoms of laryngeal obstruction with marked epigastric retraction. It was felt that this might be the result of the double bronchoscopy short as each had been, that it would probably be of short duration and that intubation would tide the child over and avoid a tracheotomy. Accordingly an intubation tube was introduced indirectly with immediate relief to all respiratory symptoms. Twenty-four hours later the tube was removed but had to be

replaced. Forty-eight hours after this the tube was again removed and left out. It was now considered that all would be well and that in a few days the child could go home. During the next week no acute symptoms developed, though there was a recurrence of the original laryngeal wheeze, rather more marked than on admission. The most prominent feature of the child's condition during this interval was a marked degree of general exhaustion, evidenced by an inability to remain awake when sitting up and indisposition to eat, talk or play normally.

On April 11 there was a sudden and unexpected return of the laryngeal obstruction and the intubation tube had to be replaced. No explanation could be found for the return of this condition, which proved still more distressing than before since it was found to be impossible to remove the intubation tube for any length of time. Fear of causing thus a permanent laryngeal ulceration or stricture from repeated or permanent intubation led the author to perform a tracheotomy under local anesthesia on April 12. The next day the child was breathing comfortably through the tube, but still appeared markedly exhausted. A slight elevation of temperature was present for the next few days following which the patient developed a rash diagnosed as measles, the course of which was greatly shortened by a dose of serum. The patient was isolated, and, the disease being so light, was not sent to a contagious hospital so that his original condition was observed throughout. For the next week unsuccessful attempts were made to begin decanulation by partial corking but complete closure of the tracheotomy opening caused marked dyspnea. Phonation however was clear and it began to appear that perhaps a tracheal band or granulation might be the cause of the difficulty. On May 1, however, a complete cork was suddenly tolerated without any trouble and two days later the tracheotomy tube was removed. The wound closed rapidly, no further symptoms developed, and the child was discharged.

Such complications as occurred in this case at once prompt one to discover if possible their cause and how they might have been avoided. The momentary suspicion that the foreign body after the two weeks symptomless interval might have remained in situ indefinitely without ill effects can be dismissed at once, since a subsequent pulmonary infection would almost certainly have developed. The most obvious error was the failure to remove the entire kernel at the first bronchoscopy, the cause of which can be readily understood by anyone who has done much of this work. The chief source of debate lies in the question as to whether at the time of development of the laryngeal edema tracheotomy would have been a wiser procedure than intubation. It was thought that this edema

was a purely temporary affair resulting from two closely timed bronchoscopies and that it would subside in a very short time. Apparently however intubation, particularly at the second time, only irritated the larynx still more till a point was reached at which the tube could not be removed. Fortunately at no time was emergency tracheotomy necessary, and when performed in this case the intubation tube was conveniently left in situ till the trachea was opened.

**CASE II.** The second case was that of a child twenty months old who was brought to the Children's Hospital on the advice of the first physician consulted because of the parents' statement that 4 days before she had "choked" while eating peanuts. Since then there had been a wheezing character to the respiration with an occasional cough. On admission nothing definite could be made out on physical examination and inability to secure an X-ray that was definitely at the end of either expiration or inspiration made it impossible to make use of the phenomenon of obstructive emphysema. The ray was apparently negative. The next day bronchoscopy was performed without anesthesia and a 4 mm. tube inserted into the trachea. At the septum between the middle and lower

lobes of the right lung was seen a white object which was grasped with side-grasping forceps and removed through the bronchoscope leaving the latter in place. The object was found to be a small piece of slightly macerated material which most closely resembled a portion of the husk or jacket found around peanut kernels after the outer shell is removed. A second inspection of the right bronchial tree now disclosed an entirely normal appearance. The next day all wheezing had disappeared and the child has been perfectly well ever since. While the absolute identity of the foreign body in this case could not be established, the history, findings and outcome indicate its having been a nut fragment.

Constant practice contributes to success in any surgical procedure, and it is the infrequency of these foreign body cases which makes removal all the more difficult. All possible help must be sought from the internist and roentgenologist, a complete and perfectly working equipment must be always at hand, and a team of assistants thoroughly familiar with this work must be available. Beyond this the willingness of the operator to develop his skill by practice in the laboratory and on the manikin will determine his success.

## HEALTH PROMOTION THROUGH NUTRITION WORK

BY HAROLD A. ROSENBAUM, M. D.

MUCH has been said and written about children's nutrition work and it has received much consideration in some school health systems and other agencies which are apart from the great body of practicing physicians. It is for this reason that I wish to tell something of this work and to show the need which it supplies in the field of medicine and public health. For the past four years I have been associated with the Elizabeth McCormick Memorial Fund and this work forms the basis of my discussion.

The work carried on by the nutrition department of the Elizabeth McCormick Memorial Fund is with children of the pensioned mothers group, the United Charities of Chicago, public and private schools, and groups of children in several social settlements. The children are selected for the most part according to the height weight standard, which is probably the best single test for determining malnutrition. This work of weighing and measuring is done by a nutrition worker. However, this Fund has a conviction that a physician should survey the entire group, those up to weight for height and age as well as those below. Not infrequently children of average weight or above are manifestly not in good nutrition or good health. These children are apt to be pale, fattish, and flabby and are often short in stature. In one group in

which all the children were examined, 10% of them were considered by the physician poorly nourished although up to or above the average weight for height. When the child is much below weight he is usually in need of medical attention.

The children are at first weighed and measured and later examined in family groups and when at all possible the mother is required to be present so that her interest and cooperation may be secured and also that she may give details of the family and personal history, dietary, habits, etc., not known by the children and that she may understand fully any desirable change in the management of her family.

The mother's presence at the examination has very great educational value. She is often awakened to the existence of facts and conditions entirely unknown to her and she can be instructed, encouraged, and stimulated. It has happened that the child understood and wished to do as advised but the mother was uninterested or uncooperative. On these cases progress is slow or impossible until the mother can be interested and her cooperation relied upon.

The social worker or pension officer is often able to contribute much useful information about the home, which is important to the nutrition worker in directing her efforts. For ex-

ample, the social worker may know that the mother has little idea of cooking, meal planning or some other requirements for good home making. For cooking, meal planning and budgeting the income, mothers' classes have been given in some of the settlements when the need existed. They are very useful and much enjoyed by the mother. By good rapport of nutrition worker and the teacher of the cooking class any needed point can be stressed.

Some of the children are put into nutrition classes. These children are especially selected because of very bad nutrition which needs the constant supervision of a nutrition worker, or where the health habits or dietary need constant checking up, or where lack of understanding or coöperation in the home necessitates frequent contacts. Each case has to be treated on its own merits as in the following example, George L., age fifteen and his sister Mary L., age thirteen who were coöperative and very bright in school. Physical examination was essentially negative excepting that they were the tall, long waisted gaunt type of individual variously called ptotic type, Stiller type, asthenic type, etc. An analysis disclosed a diet poorly balanced and much too low in calories, and lack of sufficient sleep. Although they were very badly nourished we did not feel that they needed to be placed in a nutrition class because they were unusually bright and coöperative. We felt that any instruction given would be understood and acted upon and we decided to see them monthly. They coöperated well and when weighed a month later had gained respectively 8.2 and 3.8 pounds.

On the other hand an example where the desired results could be secured only by frequent contacts with the mother and the family as provided in the weekly nutrition class is the following:—the oldest child in the family, a boy of eight years and the youngest, a boy of three and a half years were well nourished but the child between the two, a boy of five and a half years, was poorly nourished and some choreic. All the children were mischievous and bright and the mother, though well meaning, was irritable, nagged and frequently became angry with the children on slight provocation. The nutrition worker who came in weekly contact with the mother secured her confidence and by frequent tactful suggestions was able to change the mother's conduct toward the children. The middle child, Carl, improved slowly but steadily and when seen twelve months after our first contact with the family, was rosy, well nourished and stable and the mother was much better poised.

Sophie M., five and one half years old at the time of enrollment September 22, 1923, was in poor nutrition. The father was insane and the mother continually worried about the children and nagged with this little girl to make her eat. The mother was seen weekly at the nutrition

class and encouraged to let the child alone when at the table. By April 3, 1924, she had gained five pounds and was in good flesh and rosy. During the summer there was no contact with the family. In September, 1924, she was again in poor nutrition and it was found that the mother was again over-anxious. From that time she continued in the nutrition class and on November 3, 1924, the child had made great general improvement and had gained four and a half pounds. In this case frequent contact was necessary to keep the mother properly directed.

The children of the United Charities are weighed monthly and the recommendations of the examining physician and the nutrition worker are carried out by the social worker. In the pension groups the pension officer sees that the recommendations are carried out.

Regarding the nutrition worker the more broadly she is equipped, the better. The first essential is that she be able to get the coöperation of her mothers and children. She should know social work, home economics including the care and management of children physically and psychologically, and should have a good medical viewpoint. By good medical viewpoint I mean that she should have a knowledge of physiology and of the relation of physical defects and disease to nutrition. To get the best results the work cannot be carried on in a routine manner; it requires good training, experience, individualization, and resourcefulness.

The routine of case procedure is a complete medical history including the child's dietary and regime; a complete physical examination; and any recommendations as to the correction of existing defects, improper regime or dietary, laboratory work or consultations. Recommendations are also made by the physician as to the disposition of the case, that is, whether the nutrition class is advised, periodic examination, or, after consultation with the social and nutrition worker, a preventorium.

The above gives some idea of the organization of the work. As in other medical work some cases are cured, some improved, and a few make little progress. The whole story is not told in pounds. Many of the children who do not gain rapidly in weight improve in color, muscle tone, posture and poise. We have had habits like enuresis improve or entirely disappear. The following are examples of other results:

Lillian P., age twelve was poorly nourished, doing poorly in school both in deportment and studies and was very difficult for the mother to manage. For four weeks she was in the class without manifesting interest and not gaining at all in weight. The nutrition worker secured her coöperation and she was persuaded to discontinue tea and coffee entirely and to substitute milk, to go to bed at 8:00 p. m. and to eat cereal for breakfast. From October 15, 1924, to Jan-

uary 14, 1925, she gained fourteen and a quarter pounds and was like a different girl with much better poise, improved posture and color. She became manageable at home and the report sent from school had changed radically. She had received a good mark in deportment and much better grades. She is still following this healthful regime and is gaining in weight and gives the appearance of very good health.

Frank D., age fifteen, much undersize (54 inches—average height for 10 year old boy) and 9% underweight for height, complained of frequent rather severe headaches. Nothing organically wrong could be found on physical examination including eye examination by a competent specialist; urine and Wassermann tests were negative. His diet was insufficient in calories and very poorly balanced. With an increase in the family allowance secured through nutrition and social worker the diet was improved. The boy gained two pounds in weight in four months with marked general improvement and the headaches entirely disappeared. Many other cases could be cited showing the results of nutrition work.

There are many medical institutions and other agencies of public service where nutrition

work would seem to have a place. In hospitals and dispensaries where children are treated the members of the staff are naturally interested in the purely medical problems and their treatment. The time which physicians devote to work in dispensaries and hospitals is limited. As a consequence these cases of secondary medical interest are given an unimportant place in comparison with pressing, acute cases and those where diagnostic problems are involved. The highest degree of efficiency and medical service is obtained by a hospital or dispensary only when these cases also are cared for, requiring the services of a physician or physicians and nutrition worker.

We have attempted to show something of the manner of carrying on nutrition work including the selection of cases. Their study through the coöperation of physician or physicians, nutrition worker, and social agents has been detailed and we have shown the disposition of the cases and given some idea of the results obtained. We feel that there is often a real need for the work that is not filled and that the work may well be carried on in schools, social settlements and is especially indicated in dispensaries where children are treated.

## THE CAPE COD HEALTH DISTRICT

BY A. P. GOFF, M. D.

*Surgeon (R) United States Public Health Service, District Health Officer*

COOPERATIVE health work was inaugurated on Cape Cod in May, 1921, and is therefore now in its fifth year. Ten of the fifteen towns in Barnstable County (Cape Cod) are included in this organization and the others are discussing the matter of entering. The town on Cape Cod is a distinct political unit and an appropriation such as that for health work can be made only by consent of the citizens at town meeting. The Cape Cod Health Bureau (so called) is an organization representing the various towns on the Cape through the local Boards of Health and School Committees. The officers consist of a President, Vice President, and Secretary-Treasurer elected by the members of the organization. Meetings are held twice a year, or oftener if necessary and all matters pertaining to work of the organization are discussed as fully as possible.

The executive unit of the organization consists of the District Health Officer and his clerk and the Sanitary and Milk Inspector. The nurses on the Cape are appointed locally in the various towns and work in coöperation with the Health Officer. As a rule the District Nurses are also school nurses but in one or two of the larger towns there is a separate school nurse.

In this Health District the Sanitary Inspector spends a large part of his time in milk

inspection. Dairies are quite numerous on the Cape, although usually consisting only of a small number of cattle. About 50 per cent of the cows have now been tested for tuberculosis.

The work of the Health Officer and others consists of the usual duties devolving on such organizations.—Special stress probably being laid on school work. The matter of limiting communicable diseases is given a great deal of attention not only in connection with the schools, but in the community in general. The regulation of dumping grounds and the disposal of garbage is being seriously considered by all of the towns of the Cape, as this becomes a more serious question each year.

All food places, hotels, etc., are inspected and the question of contamination of shellfish beds of course occupies a good deal of time in this locality.

The fund for carrying on this organization is voted by each town at the annual town meeting and a liberal amount is contributed by the Federal government (U. S. Public Health Service). Each local Board of Health appoints the Health Officer as its agent; each School Committee also appoints the Health Officer as school physician. The appropriations from the towns are paid quarterly or monthly to the Secretary-Treasurer and the Federal appropriation is paid



monthly by pay roll. All bills are passed by the Health Officer and forwarded for approval to the President of the Association and then are forwarded by the Health Officer to the Secretary-Treasurer for payment by check. After the salaries the main expenses are of course transportation. The roads on the Cape are remarkably good and every portion of the district may be reached by car.

The coöperation of all organizations and citizens of the Cape has been quite remarkable, and especial mention should be made of the medical men of the Cape. The work of the organization has shown apparently that it is of value to the community and judging from the general senti-

ment expressed at the last meeting of the Association it would seem that there is not only no sentiment against the work, but to the contrary a strong feeling in its favor.

As Surgeon L. L. Lumsden, United States Public Health Service has said this project has furnished probably the severest test of the coöperative rural health work system. Cape Cod is one of the oldest and most conservative communities and the town system of government is zealously guarded.

For a unified District Health system to continue on the Cape as much as five years is indicative of the soundness of the plan.

## VULVO-VAGINAL INFLAMMATION DUE TO MERCURY POISONING

BY HERBERT J. CRONIN, M.D., CAMBRIDGE, MASS.

SEVERE vulvo-vaginal inflammation with mild constitutional symptoms resulted from improper local use of a mercuric chloride tablet, grs.  $7\frac{1}{2}$ .

Case. M. K., American, white, married, age 20, had been under treatment for two months in a gynecological clinic for acute gonorrhea and was using mercuric chloride solution 1-5000 as a vaginal douche. Five years before she had had a nephrectomy operation the remaining kidney was functioning satisfactorily.

In order to hasten the cure of the condition,

the patient inserted a mercuric chloride tablet within the vagina. A few hours later a local swelling appeared accompanied by severe pain and syncope.

Marked pendulous edema of all the vulval parts with necrotic areas about the introitus was seen on examination. Albuminuria and mild stomatitis developed within a few days. The treatment consisted of saline irrigations and 2% sodium bicarbonate ointment locally; rest in bed, milk diet, forced fluids, and free catharsis. Complete recovery occurred in three weeks.

## UNUSUAL CASE OF HEAT PROSTRATION

BY FREDERICK S. HOPKINS, M.D., SPRINGFIELD

A body temperature of 110 degrees is so unusual that the following case of heat prostration with recovery may be of interest.

On June 6, 1925, at 3.45 P. M. when the atmospheric temperature was 105, F. K., age 50, a Lithuanian laborer, was seen at a freight house lying unconscious and relaxed. His skin was hot and dry, and his cheeks were covered with vomitus. He was rushed to the Springfield Hospital where his rectal temperature was just above the 110 calibration and was estimated at 110.2. He was packed in ice and a continuous colonic irrigation with ice water was used. Within 30 minutes the rectal thermometer recorded 93 degrees. He became semiconscious and vomited. About 1 hour later his temperature was 100.6, and it continued to rise in spite of cold sponge baths to 105.6. Then ice packs and colonic irrigations caused another sudden drop to a temperature of 94.6 which later fell to 93.6, although he was

wrapped in dry blankets. A third rise occurred at 10.45 P. M., when a maximum of 105 was followed by a drop to 97. He had a series of tetanic convulsions lasting practically throughout the night. During the next few days there were several rises in temperature of a lesser extent, all responding to ice packs, and all showing the same tendency for the temperature to continue to drop after stopping the pack, e. g. from 100.6 to 94 one half hour later. Although conscious most of the time, he was very irrational, excitable and had hallucinations. For two days he had to be strapped to his bed. He developed a mild acute bronchitis which lasted for one week. His mental symptoms cleared on the seventh day, and thereafter he made an uneventful recovery.

During this same period of hot weather there were three other cases of heat prostration in the Springfield Hospital with maximum temperatures of 103°, 106.6°, and 109° respectively.

**Case Records**  
of the  
**Massachusetts General Hospital**

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN  
WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY

RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.  
F. M. PAINTER, A.B., ASSISTANT EDITOR

**CASE 11311**

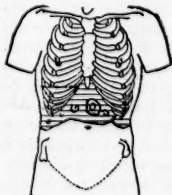
**MEDICAL DEPARTMENT**

AN Irish-American carriage driver of fifty-six was referred from the Out-Patient Department February 10. His past history was entirely negative except for a little touch of rheumatism and the use of alcohol,—three or four glasses of whiskey a day and four or five of beer.

The November before admission he began to grow weak. Since that time he had lost weight. His appetite was excellent and he had no gastrointestinal symptoms except some belching of gas. For two months he had noticed jaundice. About the first of December he stopped work.

Examination showed a fairly well developed, poorly nourished man weighing 102½ pounds and showing marked loss of weight. The skin and conjunctivae were yellow, the teeth poor. The heart showed no enlargement. The sounds and action were normal. There was a harsh systolic murmur at the apex transmitted to the axilla and heard at the base. The aortic second sound was slightly accentuated. The artery walls were thickened and slightly tortuous. The pulses were of increased tension. The blood pressure is not recorded. The abdomen was slightly prominent in the epigastrium and the lower portion. In the left flank a small sausage-shaped mass (sigmoid?) could be rolled under the fingers. The liver dullness extended from the sixth rib to 4 cm. below the costal margin, where the edge was felt, 9 cm. below the tip of the ensiform. The surface was slightly irregular. Two distinct masses were palpable on it. In the groin was a brown scab.

The temperature was 96.8° to 101°, with periods of elevation from admission to February 23, February 28 to March 8, March 20 to 23 and April 23 to 27, three days before death. The pulse was 74 to 132. The respirations were 10 to 28 except for one rise to 40 April 26. The urine was normal in amount, cloudy at both of two examinations, showed the slightest possible trace of albumin at one and bile at both, specific gravity 1.015 to 1.018. The hemoglobin was 80 per cent., leu-



cocytes 8,500, smear normal. A Wassermann was negative. The stools were negative to guaiac at three examinations. At a stomach examination February 14 no fasting contents were obtained. The stomach washings were normal. The stomach was inflated and the lower border found to be one centimeter above the umbilicus. There was no evidence of enlargement or displacement. The inflated stomach lay behind the mass felt in the liver region. The test meal gave 20 c.c. of homogeneous thick white bread residue with a sour odor, no free HCl, total acid 0.05, lactic acid present, guaiac negative; no pus, blood or sarcinae. February 21 the fasting contents were 20 cubic centimeters of light brown fluid mucus, no free HCl, lactic acid present, a small amount of dark blood clot, no food residue. The test meal gave one ounce of gray bread residue with a little dark blood clot, odor slightly sour, no free HCl, total acid 0.03, lactic acid present.

The patient had no symptoms of any kind, but rapidly grew worse. He lay in stupor or slept most of the time. His mind was not always clear; he did strange things. The jaundice increased. Antisyphilitic treatment was pushed. His strength and mental condition failed steadily.

Beginning February 22 there was a very marked improvement in his mental and physical condition. The mass in the epigastrium seemed rather less. February 25 he was given 420 grains of potassium iodid and during the following days 100 grains three times a day. The improvement continued. February 27 he complained of some pain in the left side, much relieved by a tight swathe. A friction rub was heard in the axilla. March 4 there was a little fluid in the left base. The mass in the epigastrium did not increase in size. He gained weight. He did not however make continuous improvement under mercury and potassium iodid. The night of March 9 he was irrational, the following morning mentally clear. The delirium however gradually increased; March 14 he was irrational nearly all the time. The jaundice also increased. Dr. Cabot noted, "At least two deep indentations can be felt in the edge of the liver. The trouble involves chiefly the right lobe. There is an interval between the liver and the spleen, and Traube's space is tympanitic. The patient is brightening up and holding water better under KI." March 18 he slept most of the time except for periods when he tried to get out of bed, saying he wanted to go home. Urine examinations at two-hour intervals following the administration of 100 grams of glucose showed sugar in two specimens. March 18 a similar test following 100 grams of levulose showed sugar present in three specimens.

By March 27 the delirium was growing more marked and the general condition poorer. Potassium iodid was resumed. By April 11 the

sensorium and jaundice had cleared somewhat, but there was no change in the abdominal condition. By April 19 the sensorium was again clouded, although potassium iodid was still being given. April 23 two septic bloody blebs on the left hand were dressed, with considerable hemorrhage. Following this the temperature, pulse and respiratory rate rose and the patient became much weaker. April 30 he died.

#### DISCUSSION

BY DR. RICHARD C. CABOT

#### NOTES ON THE HISTORY

We have two essential facts here, jaundice and weakness in a man of fifty-six with an alcoholic history. Naturally the thing first in our minds is cirrhosis, though many cases of cirrhosis do not show jaundice.

#### NOTES ON THE PHYSICAL EXAMINATION

This was about fifteen years ago. We were not taking blood pressures regularly then.

What have we on the heart? I should say this is just the sort of heart record from which we can tell absolutely nothing. It might be a normal heart so far as I know. It might be an arteriosclerotic heart. It might have some aortic or other lesion.

A PHYSICIAN: Can you tell whether a systolic murmur at the apex is functional or organic?

DR. CABOT: I cannot, and I don't believe any human being can tell. Of course the louder it is the more impressed we are. When we hear this very loud noise there is a reaction in our tissues. But I have been fooled so many times that I do not undertake to say what it means.

A PHYSICIAN: We have such a case now, and the question came up whether we could have arteriosclerosis of the mitral valve producing such a murmur. I did not think so.

DR. CABOT: No. We can have arteriosclerosis of the arch, though, apparently producing such an apical systolic murmur. Mitral regurgitation is still the commonest diagnosis in hospital statistics, and we had only seven cases out of all the necropsies in over twenty years here, and three of those doubtful.

This is a very deceptive remark about the mass in the left flank. We are always feeling masses that can be rolled under the fingers. I think it means nothing unless we have something more definite than this.

"The surface of the liver was slightly irregular" is a very deceptive finding also. The irregularities we find in cirrhosis can almost never be felt through the abdominal wall, and when we do feel them they generally turn out not to be there, to be in the fat of the abdomen rather than in the liver itself. So that although this is just the sort of case where we should be looking

for cirrhosis, I do not regard this finding as strengthening that case at all. When we feel sure of irregularities in the liver it is generally either cancer or syphilis. Distinct masses palpable on the liver generally mean cancer, rarely syphilis.

There is very little swing of gravity in the urine, but we had only two examinations, so I suppose we ought not to pay any particular attention to it.

This sounds like the old times when it was a religious duty to inflate the stomach. The trouble was, it would not always deflate itself, and the person was left with a very uncomfortable mass in the abdomen. Any record of the lower border above the umbilicus is normal. It goes below in abnormal cases.

They found blood in the stomach contents twice.

This report is a little paradoxical,—"he was perfectly well but got worse." I suppose it means that he did not complain, but his objective condition became aggravated.

They gave him antisypilitic treatment because there was nothing else to do. After February 22 they probably began to pat themselves on the back because of it.

This is a good old-fashioned way of putting in potassium iodid.

He gained weight, whether due to fluid and the accumulation in his pleura we do not know.

#### DIFFERENTIAL DIAGNOSIS

He died of an intercurrent infection, I think probably of streptococcus, and underneath it of something in the liver. There are three possibilities that we think of: cirrhosis, malignant disease, syphilis.

We know that any bet of syphilis is a poor bet. It is a diagnosis that they seem to have a strange prejudice against here and almost never confirm. Then syphilis under such treatment, even though it did not include salvarsan (because it was not invented) still ought to improve, and it did not. I do not believe he had syphilis of the liver. We are left, then, with malignant disease and cirrhosis. Of course if we had had a gastric X-ray we should have been much surer, because if it is cancer of the liver it probably came from the stomach. But I do not believe we have much against the stomach. He has very little in the way of stomach symptoms, and we can account for his loss of weight perfectly well in other ways.

DR. RICHARDSON: Does it say anything about his skin?

DR. CABOT: It says it is jaundiced, nothing else. He certainly has some obstruction I should say in his biliary tract. We do not seem to have any ascites. It is rather unusual to have a patient die of cirrhosis of the liver without ascites. His mental condition is just what we do see in

cirrhosis, but we also see it in late cases of malignant disease.

A PHYSICIAN: It is interesting that his appetite was good and he had no gastro-intestinal symptoms. That is against cirrhosis, isn't it?

DR. CABOT: Yes, but it is against the other diagnosis too. A person dying with as much jaundice as this ought to have a poor digestion.

DR. RICHARDSON: Perhaps it was the potassium iodid.

DR. CABOT: It does not usually have that effect. It really seems to me very much a toss-up between malignant disease and cirrhosis. I cannot marshal any strong evidence pointing either way. Was the jaundice deep?

DR. RICHARDSON: It was good old-fashioned jaundice.

A PHYSICIAN: He had rather a big liver for cirrhosis.

DR. CABOT: Yes, but we get them big.

A PHYSICIAN: Don't you think the absence of hydrochloric acid favors cancer of the stomach?

DR. CABOT: Yes, that is on that side. I think the thing that weighs with me mostly against cirrhosis is the absence of ascites in a person who has got to this stage of the disease.

MISS PAINTER: I do not know that the summary emphasizes the long drowsy periods as much as the history does.

DR. CABOT: I think we have that clearly. He was drowsy a long time, but that does not help in the particular differential. We get that in both cancer and cirrhosis.

A PHYSICIAN: But cirrhosis causing jaundice is not very common.

DR. CABOT: No; I think about thirty-three per cent. of the cirrhosis cases have jaundice. I do not know whether that is associated with small or big livers. I think the two facts that weigh most are the absence of ascites and the presence of palpable nodules. So I am going to say neoplasm of the liver. If so, is it primary in the liver or does it start somewhere else? It seems to me we have very little evidence incriminating the stomach. There is the absence of hydrochloric acid, but we get that with cancer of the breast and other conditions. This may be primary in the pancreas. I have no evidence to say where it is primary, but I believe it is malignant disease secondary in the liver.

DR. RICHARDSON: You hold distinctly to that description. How about the mass he felt down low?

DR. CABOT: He felt that once and described it in a way which might be normal intestine so far as I know.

A PHYSICIAN: If it was carcinoma how could he live so long?

DR. CABOT: We do not know it has been as big as this for six months, and we do not know what happened before that except that he was sick.

# CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Cirrhosis of the liver.

DR. RICHARD C. CABOT'S DIAGNOSIS

Malignant disease of the liver, secondary.  
Terminal infection.

## ANATOMICAL DIAGNOSIS

### 1. Primary fatal lesions

Chronic interstitial hepatitis.

### 2. Secondary or terminal lesions

Icterus.

Arteriosclerosis.

Hemorrhagic edema of the lungs.

Slight hypertrophy and dilatation of the heart.

Hypertrophy of the spleen.

Slight chronic interstitial nephritis.

Edema piae.

### 3. Historical landmarks

Chronic pleuritis.

Accessory lobe of the right lung.

DR. RICHARDSON: There was well marked icterus.

The brain weighed 1343 grams, was a little wet, and there was some edema of the pia.

The skin over the left index finger showed reddish crusts; I presume that is what was mentioned.

There were fibrous adhesions between the omentum and the anterior surface of the spleen. The margin of the liver was at the costal border. Nothing was felt or found of the masses in the liver mentioned in the clinical record.

The lungs showed some edema. The tissue generally was dark red. While we could make out no definite areas of pneumonia, still microscopical examination showed collections of leucocytes in some of the alveoli as though there might have been beginning pneumonia.

There was some sclerosis of the coronary arteries. Otherwise the circulatory apparatus generally was negative.

The liver weighed 1271 grams and showed cirrhosis. The surface was granular, not very markedly, but still granular, the tissue tough, and the section surface granular with a faint meshwork of gray lines,—a picture macroscopically of cirrhosis of the liver. Microscopical examination showed it to be cirrhosis of the liver.

The spleen weighed 319 grams, moderately enlarged, with firm tissue, and of course to be associated with the cirrhosis of the liver.

The mucosa of the stomach was markedly reddened, velvety, and infiltrated with thin bloody fluid. The intestines showed considerable reddening of the mucosa but were otherwise negative.

There were a few foci of atrophy in the kidneys, but there were no masses anywhere.



DR. CABOT: I think this heart is well worth remembering—a perfectly normal heart. Then the fact that one can die with cirrhosis, with jaundice, and without ascites in this way, and with a persistent absence of hydrochloric acid. It is well to tuck those facts away in the memory.

DR. YOUNG: I have been interested in following your logic in the hospital record and now. You swung between the two things then; the only difference is that you ended with cirrhosis then.

# CASE 11312

## MEDICAL DEPARTMENT

AN Armenian housewife of thirty-five entered February 17. The history was incomplete because of poor English. She had attacks of acute rheumatic fever at fourteen, twenty and thirty involving the small joints. After the third she was told she had heart trouble, but had no symptoms except slight dyspnea on exertion. Four weeks before admission she had facial erysipelas with fever and mild delirium lasting five days. Three days later she delivered herself in a normal fashion. She believed she was at term. Her labor was not difficult and she remained in bed only four or five days. On the sixth day her hands and feet became reddened, swollen and tender upon motion. Within a few days practically all the smaller joints were successively involved.

Examination showed a well developed and nourished woman with dry skin and flushed cheeks. The mucous membranes were red. The tongue showed fine tremor. The apex of the left lung posteriorly showed increased vocal resonance and whispered voice with bronchial breathing, the left base increased whisper. The chest was clear in front. The apex impulse of the heart was felt in the fourth space 9 cm. to the left, 1 cm. outside the midclavicular line. The percussion measurements are shown in Figure 1. The action was slow. The sounds were of good

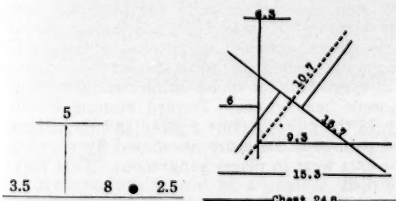


FIGURE 1. Measurements by percussion, first entry.

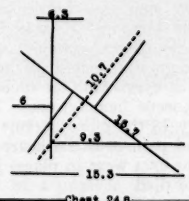


FIGURE 2. Measurements by X-ray, first entry.

quality. The pulmonic second sound was markedly accentuated. A loud systolic murmur was heard over the precordia and the apex. The first sound was somewhat loud. The blood pressure was 90/55. The artery walls were normal. The

liver dullness extended from the fifth rib. The edge was just felt. The spleen was felt 3 cm. below the costal margin. The fingers were clubbed. The knees seemed somewhat swollen. Slow motion was permitted but seemed to give twinges of pain.

The day of admission the temperature rose from 98.8° to 104.8°, falling the next morning to 96.9° and ranging afterwards from 96.3° to 99.1°. The pulse was 56 to 86, the respiration 16 to 32. The urine was cloudy at one of three examinations, showed the slightest possible trace of albumin at one, possible bile at one, four to six leucocytes per high power field at all, specific gravity 1.012 to 1.024. The amount was 66 to 12 ounces. The hemoglobin was 60 per cent., the leucocytes 6,500 to 12,400, the polynuclears 66 per cent., the reds 3,648,000, with slight achromia. A Wassermann was negative. X-ray showed the outline of the right antrum smaller than the left and less radiant. The right ethmoid region was also less radiant than the left. The frontal sinuses appeared normal. The heart shadow was enlarged (see Figure 2) and somewhat triangular. The greatest prominence was in the region of the right auricle.

Great improvement followed salicylates. By the 19th the acute condition had cleared in all the joints strikingly. February 26 she was discharged.

During the next two years and nine months she was comfortable. Then she began to worry about financial conditions, and being an excitable, highly neurotic woman worked hard scrubbing floors and washing clothes. Suddenly she had a chill with fever and profuse perspiration, recurring the next day. Following this she had profuse sweating with fever at four o'clock every morning, not accompanied by chill. The end of December, a month after the first chill, she began to have gradual onset of dull pain in the left abdomen along the splenic area which persisted more or less constantly. Her dyspnea became marked and she had palpitation and orthopnea, requiring three or more large pillows. With the onset of the pain her abdomen began to show swelling which had been progressive. She had cough with sputum in the morning, and slight cough during the rest of the day. There was possible moderate edema in the wrists, forearms and ankles. During the year before her readmission she had lost about forty pounds and since the summer twenty pounds. Her appetite was extremely poor. She felt general fatigue. For two months she had been seriously worried by her husband's buying a house.

January 30, three years after her last discharge, she returned.

She now gave a history of malaria in childhood and a second attack at twenty-seven. For ten or twelve years she had had nosebleeds for which she used some medication. She urinated once at night. For several years her catamenia had been excessive.

The examiner at this time recorded her as only fairly well developed, undernourished. The liver edge was felt 10 cm. below the costal margin, tender and fairly firm. The liver flatness began at the sixth space and measured to the edge 17 cm. The semilunar space was dull. The edge of the spleen was felt 8 cm. below the costal margin, notched, not tender. There was tenderness at the upper border, but this was thought probably to be the liver edge. It was thought the kidneys, especially the right one, could be felt from behind. There was diastasis recti bulging one or two cm. on cough. The apex impulse of the heart was in the fifth space 10 cm. from midsternum. The percussion measurements were as shown in Figure 3. The shape was like the heart of mitral disease. The apex impulse and the right and left borders did not shift with

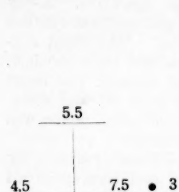


FIGURE 3. Measurements by percussion, second entry.

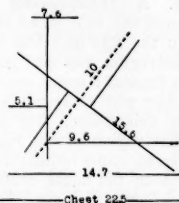


FIGURE 4. Measurements by X-ray, second entry.

position. There was epigastric retraction with systole. At the apex the mitral first sound was loud and followed by a harsh systolic murmur transmitted to the axilla. There was a rough diastolic murmur. There were systolic and diastolic apical thrills. The pulmonic second sound was accentuated and reduplicated. There was no aortic diastolic. The brachials were tortuous and slightly hardened. The blood pressure was 120/80 to 100/60. Rectal examination caused pain.

The temperature was 98.2° to 101° until February 6, afterwards 101° to 105°. The pulse was 66 to 100 until February 10, then 78 to 131. The respirations were 20 to 28 until February 7, then 24 to 49. The urine showed a very slight trace to a trace of albumin at all of four examinations, 5 to 10 leucocytes per high power field at three, many leucocytes at another, loaded with leucocytes and red blood corpuscles at the last, 4 to 30 red blood corpuscles per high power field at two. The specific gravity was 1.016 to 1.010. The amount of urine was normal when recorded. A catheter specimen February 2 showed a very slight trace of albumin, 6 to 8 leucocytes and 4 to 5 red blood corpuscles per high power field. Culture from this specimen was sterile. The renal function was 10 to 30 per cent. at three tests. The hemoglobin was 55 to 40 per cent. The leucocyte counts were 35,000 (†) January 30, 4,800 January 31, 22,000 (†) February 1, 4,200 February 3, February 4-11 14,200 to 21,800 with one count of 5,700. The polynuclears were 48 to

66 per cent., February 9, 75 per cent. The reds were 2,540,000 to 3,300,000 with moderate variation in size and shape, some achromia and occasional polychromatophilic cells at one of four examinations. A Wassermann was negative. The non-protein nitrogen was 31 mgm. The bleeding time was two minutes, the coagulation time 10-12 minutes. The clot retraction was good. A blood culture February 5 was sterile. X-ray (see illustration) showed the heart shadow increased in all diameters (see Figure 4), presenting the characteristic mitral shape. (See note by Dr. Camp in legend.) The shadow of the right auricle was particularly prominent. There was no abnormality of pulsation visible and no limitation of the respiratory excursion. The supracardiac dullness was not definitely increased.

January 30 the patient had bleeding from the right nostril. She said this was the only side which bled. A nose consultant found an active spurter. Cautey failed, so packing was resorted to. The following day there was still slight but persistent bleeding. Typical endothelial phagocytes were found. Dr. P. D. White reported, "Enlargement of spleen much too great to be accounted for by subacute bacterial endocarditis. I do not think she has subacute bacterial endocarditis." Dr. G. R. Minot in consultation called attention to "beautiful endothelial phagocytes," the rapid swing in leucocytes from leucopenia to leucocytosis, the high percentage of endothelial cells, and the size and character of the spleen and liver as characteristic of a subacute bacterial endocarditis.

February 7 the temperature was considerably elevated. Next morning the left tonsil showed what seemed to be a white exudate and the patient could open her mouth only a little. A throat culture showed streptococcus. A throat consultant reported, "The tonsils appear to be innocent in this case. The mucosa of the pharynx is pale and dry. There is considerable crusting in both nares. I believe the sore throat in this case to be due to poor ventilation through the nose." That night there was an erysipelatous infection involving the right side of the face and nose. The temperature was 105°. A blood culture showed streptococcus hemolyticus. February 10 the erysipelas had spread to the left side, closing both eyes. Another blood culture showed streptococcus hemolyticus. Toward evening February 13 the pulse became weaker and the patient had pain over the heart unrelieved by morphia. The eyes were in places gangrenous. That night she died.

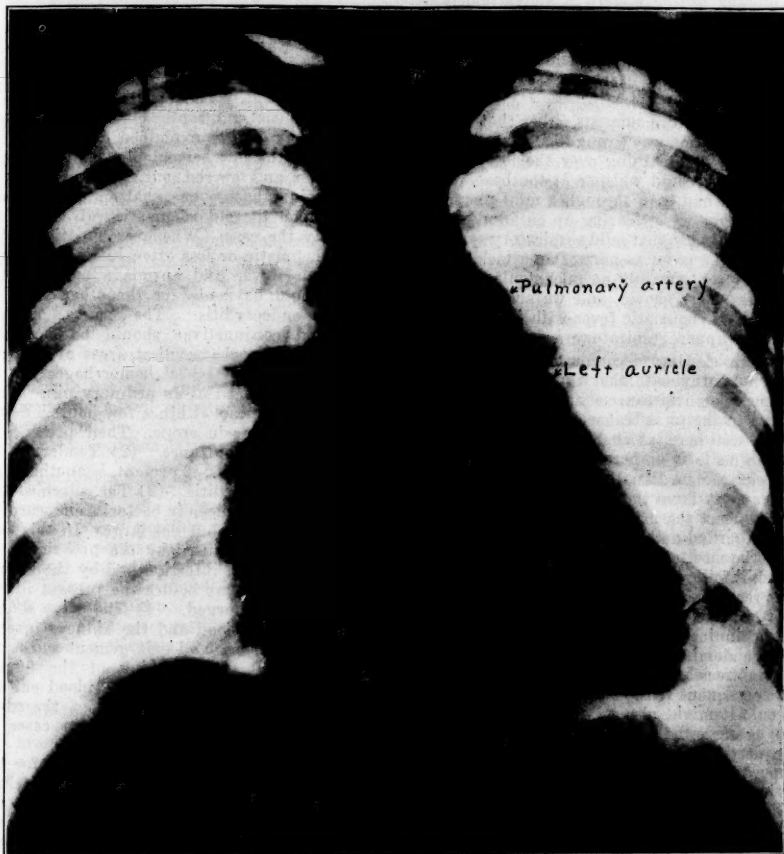
#### DISCUSSION

BY DR. MAURICE FREMONT-SMITH

Rheumatic fever involving the small joints only is unusual and is more characteristic of the type of arthritis we call infectious. It should be remembered also that the gonococcus typi-

cally attacks the small joints. In this type of infection it is more common to find one joint involved, but it is also possible to have several of the smaller joints involved and sometimes an elbow or a knee. Characteristic of rheumatic fever and unusual in the gonococcus infection is

leading even to death. I am not familiar with recrudescence of rheumatic fever occurring immediately after labor. Physical examination shows the evidence of consolidation, of moderate enlargement of the heart, with signs very suggestive but not pathognomonic of mitral steno-



Shows the heart shadow increased in all diameters, presenting the characteristic mitral shape. The shadow of the right auricle is particularly prominent. The supracardiac dullness is not definitely increased.

Note by Dr. John D. Camp: The characteristic mitral heart shows enlargement of both auricles and dilatation of the pulmonary artery.

progressive involvement of a number of joints. In other words, the gonococcus having chosen its joint usually persists in that joint.

Pregnancy has a definite influence upon the course of rheumatic fever. That is, rheumatic fever occurring during pregnancy is usually of a severer type, and the heart is very likely to be involved. Chorea likewise occurring during pregnancy may be of a very fulminating type,

sis. With the history, the loud first sound, the loud systolic murmur over the apex, we may predicate mitral disease, regurgitation certainly, and stenosis almost as certainly. The blood pressure is not lower than might be explained by the acute infection. The palpable liver edge may or may not be of significance.

Our first guess as to the cause of the large spleen would be an old malarial infection, but

the other possibilities, bacterial endocarditis, leukemias, Hodgkin's, cirrhosis and splenic anemia must be borne in mind. It must also be remembered that the spleen is enlarged in any acute infection such as pneumonia, but usually not palpable. The spleen is big for typhoid.

Clubbing of the fingers is an extremely important observation if it be correct. Real clubbing occurs in only three conditions, chronic pulmonary disease such as bronchiectasis or fibroid phthisis, congenital heart disease and subacute bacterial endocarditis.

The later picture suggests either that the physical examination was wrong in stating that there was bronchial breathing over the left posterior lung and increased whisper at the base, or that the patient had been through a mild pneumonia and the signs were clearing up on admission. Of course, we know that mild respiratory symptoms and signs can occur as part of an attack of rheumatic fever. Certainly no pneumonia could run the course here shown, and we are left with a diagnosis of rheumatic fever with a possible concomitant upper respiratory infection.

It is interesting to compare the width of the heart by X-ray with that found by percussion. The percussion measurements correspond fairly well as to the total transverse diameters, but it will be seen here, as almost invariably, that the mistake made is in percussing the right border too near the median line, and the left border too far away from the median line. In percussing the heart the first change on the left should be disregarded and the first change on the right should be most carefully noted.

A chill followed by fever suggests pyelitis, possible recrudescence of an old malaria, or the onset of lobar pneumonia or other septic condition beginning with a septicemia.

The abdominal pain coming on after the onset of symptoms might be due to the enlargement and consequent tension upon the capsule of the spleen. It might also be due to passive congestion, as suggested by the increase in signs of cardiac decompensation. The swelling of the abdomen might be due to collection of fluid or to the increasing size of the spleen.

Sixty pounds loss of weight in a woman whom we are not told was extremely obese is important. Whether we can account for this on the basis of loss of appetite due to engorgement of the gastric mucosa from passive congestion is doubtful. It is possible that this woman had been running a fever for much longer than she knew. Carcinoma must always be considered with such marked loss of weight, but here probably considered as a diagnosis only to be discarded.

We can probably best explain the marked enlargement of liver and spleen on a basis of passive congestion of these organs, remembering that the spleen is probably the locus of an old malarial infection. The heart is very definitely enlarged. The statement that the shape was

like the heart of mitral disease means that the upper border on the left rises very high and is percussable in the third, or even the second interspace. There seems also to be evidence of adherent pericardium. The diastolic murmur absent at the first examination has now appeared. The thrills suggest the possibility of an acute endocarditis.

There is nothing in the urinary examination to help us decide whether a pyelitis or simple chronic passive congestion or embolism with infarct be present. The sterile culture speaks against pyelitis and septic embolus. The low renal function can be explained by passive congestion, but the low hemoglobin, high leucocyte count, fever, and low red count make us very suspicious of a subacute bacterial endocarditis engrafted upon the old rheumatic valve, as is so frequently the case. Whenever a patient with an old rheumatic or less often luetic endocarditis develops fever and anemia a most careful search should be made for the other signs of bacterial endocarditis. The palms, fingers, wrists and conjunctivae should be carefully searched for (1) the smallest areas of redness. Sometimes these petechial hemorrhages are no larger than the head of an ordinary pin. They will often disappear within a few hours. Sometimes they appear in crops. Their presence is of the greatest importance. (2) Tenderness of the tips of the fingers, if present, is another sign of bacterial endocarditis. (3) The spleen should be palpated. The spleen in bacterial endocarditis is usually palpable, but not large. In this case the situation is confused by the probability of a previous malarial infection and by the knowledge that three years before the present illness the spleen was enlarged. (4) The urine should be examined for blood and the kidneys investigated for tenderness and enlargement as the result of emboli. (5) Clubbing of the fingers should be sought. (6) Finally a blood culture should be taken, which may show the step-tococcus viridans or may in certain cases be sterile.

The nosebleed was evidently the cause for the complete blood examination as to clotting-time, bleeding-time, etc. The finding of large endothelial phagocytic cells in the blood smear occurring in vast numbers at one time to disappear within a few minutes or hours is typical of bacterial endocarditis and occurs as far as I am aware in no other condition. These cells are unusually large and are often seen to contain red cells and rarely leucocytes.

It would be interesting if we had the complete findings of our consultants and the basis upon which they made their diagnoses for and against acute bacterial endocarditis.

MISS PAINTER: Besides the points given, Dr. White wrote his diagnosis and added, "Severe anemia. Big liver and spleen." Dr. Minot wrote, "Mr. .... demonstrated to me both phagocytizing



red blood corpuscles and vacuolated cells with granular debris."

DR. FREMONT-SMITH: It is interesting that clubbing of the fingers noted at the first examination is not now mentioned when it becomes of such diagnostic importance. Petechiae likewise are not mentioned.

MISS PAINTER: Petechiae and clubbed fingers are definitely mentioned as absent at the entrance examination. Petechiae are among the points noted to be watched for later, but are never recorded as seen.

DR. FREMONT-SMITH: I should consider the terminal erysipelas infection a secondary matter as regards diagnosis,—an overwhelming septicemia, unrelated probably to the previous condition. I believe we shall find here the evidence of a chronic and also of an acute endocarditis of the mitral and possibly of the aortic valve; adherent pericardium; passive congestion of the liver, spleen and kidneys, with probable infarcts; evidence of an old malarial spleen, chronic passive congestion of the lungs, and terminal septicemia.

#### CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Subacute bacterial endocarditis.  
Rheumatic mitral stenosis and regurgitation.  
Erysipelas.  
Streptococcus hemolyticus.

#### DR. MAURICE FREMONT-SMITH'S DIAGNOSIS

Chronic and acute endocarditis of the mitral valve and possibly of the aortic valve.  
Adherent pericardium.  
Passive congestion of the liver, spleen and kidneys, with probable infarcts.  
Old malarial spleen.  
Chronic passive congestion of the lungs.  
Terminal septicemia.

#### ANATOMICAL DIAGNOSIS

##### 1. Primary fatal lesions

Chronic endocarditis of the mitral and aortic valves.  
Acute endocarditis of the mitral valve.

##### 2. Secondary or terminal lesions

Hypertrophy and dilatation of the heart.  
Septicemia, streptococcus hemolyticus.  
Extensive facial erysipelas, purulent.  
Slight icterus.  
Slight chronic passive congestion.  
Acute pleuritis, double.  
Hypertrophy of the spleen.  
Slight capsular glomerulonephritis.

##### 3. Historical landmarks

Slight chronic pleuritis, left.

DR. RICHARDSON: The head was not examined.

There was slight icterus. The eyelids, nose and cheeks showed an extensive erysipelas, purulent in character in places.

The gastro-intestinal tract showed chronic passive congestion. The liver was 12 cm. below the costal border in the right mammillary line and the diaphragm was at the fourth rib on the right, the fifth on the left. The lung tissue showed chronic passive congestion.

There was acute pleuritis on each side. The pleura in places was coated with a thin layer of fibrinous exudate. The trachea and bronchi showed much brownish-red frothy fluid.

The heart weighed 349 grams, moderately enlarged. The myocardium was of good consistence and dark brownish red. The right ventricle wall was 3-4 mm., the left 14 mm. The columnae carneae were well marked. There was slight dilatation on the left, moderate on the right. The dilatation was a little more marked in the auricles. There was some thickening of the left auricular appendix. The tricuspid and pulmonary valves were negative. The mitral valve circumference was 5½ cm., about half of the usual size. Along the free margin of the curtain there was much fibrous thickening and deformity. It was 5 mm. thick in places and somewhat nodular. The chordae tendineae were shortened and thickened. The curtain elsewhere was slightly thickened and irregular, and extending out from the curtain of the posterior cusp on the endocardium of the left auricle there was a reddish, very faintly granular patch 4 by 3 cm. The inner surface of the patch showed a thin layer of reddish fibrinous material, but at the base the tissue was firmer and more fibrous. In several places along the thickened margin there were small grayish-yellow tag-like masses with firm bases tapering out to reddish, granular, soft tips,—chronic and acute endocarditis. The aortic valve measured 6 cm. The cusps in the region of their lower two-thirds showed some fibrous thickening with slight deformity. Along the margin of the left posterior cusp there was some fibrous nodular thickening. The coronaries, aorta and great branches were negative except that scattered along the aorta there were areas of purplish staining, sepsis. The organism recovered from the blood was the streptococcus hemolyticus.

The liver and spleen showed chronic passive congestion. The kidneys showed some passive congestion and slight capsular glomerulonephritis. The spleen weighed 750 grams, with this considerable enlargement based on congestion, infection, and the race, Armenian.

#### CASE 11313

#### SURGICAL DEPARTMENT

A two-year-old American boy entered the hospital April 19. The complaint was distended abdomen. He had been treated for the

same complaint at the Children's Hospital a year previously. Two days before admission his bowels moved. The following day he began to vomit. An enema was given without result. The vomiting continued. A physician gave a cathartic, after which the vomiting became worse and the symptoms more marked. The abdomen increased steadily in size until on the day of admission it was twice its normal size. A high enema given by a physician on the day of admission gave no result. The symptoms were becoming worse.

Examination showed a well developed and nourished baby with dull eyes, dry loose skin, dry, cracked tongue, and pale, cyanotic lips. The chest flared at the lower borders. The abdomen was enormously distended, tympanitic throughout, and tight as a drum, so that nothing could be felt. Outlined on the abdomen was a large mass (see diagram) occupying the



position of the colon from the ileocecal valve to the lower sigmoid region and extending into the pelvis. At times the baby cried with pain and complained of "belly-ache." Rectal examination showed the sphincter relaxed. At the end of the examining finger could be felt an obstruction in the lumen which did not admit the finger. This lay at about the rectosigmoid junction.

Before operation the temperature was  $101^{\circ}$ , the pulse was weak and rapid. The respiration urine and blood are not recorded.

Operation was done at once. Early in the course of the anesthesia the child showed respiratory failure. He was revived, but died on the table just after the close of the operation.

#### DISCUSSION

BY DR. EDWARD L. YOUNG, JR.

The story is that of acute intestinal obstruction in a two-year-old boy. The first thing thought of is intussusception, next congenital bands as from Meckel's diverticulum, or an acute appendicitis or possible volvulus.

The examination suggests that the first diagnosis mentioned is in fact the condition present, namely an intussusception. The commonest spot for this condition is the intussusception of the terminal ileum into the colon. This is apparently what happened. The two things which often occur which help diagnosis are not mentioned here. One is the slightly bloody discharge from the bowel, the so-called prune juice discharge due to the enormous congestion of the pinched bowel, and the other is the spasmodic vomiting which accompanies the pain, due to the peristaltic spasms of the bowel.

Of course with hindsight always better than foresight it is easy to criticize the physician

who gave a cathartic instead of recognizing the possibilities, because the cure of an intussusception depends to a large extent on how early it is treated. I should say on the chances that the prognosis for this child was very poor. The only thing of course is an attempt at surgical help, but the story shows that it did in fact come too late.

#### DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Intestinal obstruction.  
Intussusception.

#### PRE-OPERATIVE DIAGNOSIS

Intestinal obstruction.  
Hirschsprung's disease. (From the Children's Hospital.)

#### OPERATION

Ether. A small incision through the left rectus muscle was carried down to the peritoneum. On opening the cavity a fair amount of straw colored fluid poured out. A tremendously dilated loop of large intestine presented. The exploring finger discovered nothing on account of distension. A trocar was introduced into the loop of large gut letting out a large amount of gas and fluid fecal material. A Mixer tube was sewed in. The gut was very much thickened. At this point the baby suddenly collapsed and in spite of all efforts could not be brought back.

#### FURTHER DISCUSSION

Apparently the picture looked a little different from the story, because on paper I do not see how one could make that diagnosis. Here of course the Children's Hospital diagnosis was available.

#### CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Acute intestinal obstruction.  
Surgical shock.  
Toxemia.  
Exploratory laparotomy and sigmoidostomy.

#### DR. EDWARD L. YOUNG'S DIAGNOSIS

Acute intestinal obstruction.  
Hirschsprung's disease.

#### ANATOMICAL DIAGNOSIS

##### 1. Primary fatal lesion

Megacolon.  
Intestinal obstruction.

##### 2. Secondary or terminal lesions

Operation wound.  
Status lymphaticus.

##### 3. Historical landmarks

Slightly defective closure of the foramen ovale.

Dr. RICHARDSON: The head was not examined.

The abdomen was markedly distended, the wall tense. In the anterior abdominal wall there was an operation wound from which a tube protruded. The tube led into the sigmoid.

Intestines: The rectum was negative. In the region of its junction with the sigmoid it was  $2\frac{1}{2}$  cm. in circumference. Immediately above this point the sigmoid widened out and was 18 cm. in circumference. This dilatation continued upward along the large intestine for a distance of 30 cm. It reached to about the lower end of the transverse colon, where the gut was 9 cm. in circumference. From this point up to the cecum the circumference varied from 9 to 12 cm. The mucosa in the region of the greatly dilated portion was reddened and the wall thickened. The mucosa above the dilated portion was rather pale and the wall slightly thickened. The follicles were generally rather large and pale, some 2 mm. across. The small intestine was negative, except for enlarged solitary and agminated follicles. The mesenteric glands were enlarged up to 2 cm. across. The tissue was pale and plump.

The thymus gland was markedly enlarged, weighed 40 grams. The tissue was pinkish gray and meaty. The organ measured over all 7 cm. long by  $4\frac{1}{2}$  cm. wide by  $1\frac{1}{2}$  cm. thick. The trachea and bronchi contained much brownish red mucus. The bronchial glands were slightly enlarged. The tissue was plump and juicy.

The lung tissue generally was pinkish-brown, red, spongy, and yielded a small amount of thin brownish fluid.

The spleen weighed 50 grams. The tissue was negative except that the follicles were prominent.

A case then of megacolon with intestinal obstruction associated with status lymphaticus.

#### SUICIDE AND AGE

SUICIDE, in the wage-earning group of the American and Canadian populations is approximately two and one-half times as frequent among men as among women. This is shown by what has happened among the more than 16,000,000 Industrial policyholders of the Metropolitan Life Insurance Company.

The above ratio, however, relates to all ages combined. When the suicide data are studied by age periods, it is shown that the ratio of deaths of males to those of females varies greatly at different periods of life, and that the preponderance of self-murder among males increases perceptibly with advancing age.

Suicide does not assume much numerical importance until age 20 is reached. Between 20

and 24, the death rate for males approximates one and a half times that for females. Between ages 25 and 34, the ratio is a little more than two to one; during each of the next 10-year periods, it is about four to one; at 55 to 64 years, it approximates five to one; and after age 65, there are about seven times as many suicides among men as among women.

One age period, namely, 15 to 19 years, stands out in bold relief from all the rest. This is the only time of life in which suicide is more common among females. In 1923, the suicide rate of young women of these ages insured in the Metropolitan's Industrial Department, was 4.1 per 100,000—or nearly two and one-half times that for males (1.7). More than half of the young women who suicided at these ages, used solid or liquid poisons, and about one-quarter died by inhalation of poisonous gas.

At every age period of life up to 45 years, in fact, women suicides used solid or liquid poisons more than any other method; poisonous gases ranked next. Beginning with age 45, however, and up to age 65, inhalation of gas was the means most used. Among males, on the other hand, shooting is the method most generally employed, and this seems to hold for all of the age periods up to age 65.

The above data relates to white policyholders only.—*Statistical Bulletin Metropolitan Life Insurance Co.*

#### OVERCROWDING FACILITATES SPREAD OF SOCIAL DISEASES

THE National Anti-Slum League of Paris in its recent report states that overcrowding is rampant in certain sections of that city and that it may be viewed as the cause of social disintegration and the moral downfall of the family. "The danger of promiscuity," says the report, "naturally occurs when parents and children sleep in the same room and elder and younger brothers—and very often brothers and sisters—sleep in the same bed."

The housing difficulties in Germany, according to an abstract in "Social Pathology"—issued by the United States Public Health Service, have much to do with the increase of venereal diseases, particularly among children. Due to overcrowding entire families have been infected, and a coincident laxity of moral standards has been found. One report states that a family of nine slept in one room, two married couples being among the number.

An editorial in "National Health," published in London, states that "We are not likely to attain a full measure of success in the control of venereal disease until we have arrived at a solution of the housing difficulty."—*United States Public Health Service.*

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## THE INTERLUDE

THE majority of the human race prefers the slavery of prejudice to the freedom of the search for truth. It is easier to be governed by custom and tradition, by sentimentalism and desire than to show an independence of thought that may lead into difficult and little trodden paths. Few individuals, on a given subject, have the ability or the desire to form an independent opinion; many will insist on taking up the cudgels in behalf of a second-hand prejudice.

Truth is popularly described as a clear light shining in the universal darkness of human ignorance, a steadfast beacon by which thought may navigate. Truth is more difficult to find, even by the few who are honest and indefatigable in its search. It is rather a dark lantern whose light is frequently obliterated or a will-o-the-wisp that dances fitfully in strange morasses, and of those who would seek it many are heavy-lidded and many are leaden-footed and few reach the goal or know it when it is found. Truth is difficult to find, but we can at least be honest in our attempts.

Knowing the difficulties that beset the search for Truth, and the confusion in recognizing it when it is found, it seems inconceivable that man, from the depths of his ignorance, should

seek to legislate it out of existence. King Canute commanded the tide to stop, knowing in his wisdom that a greater power controlled it, hoping to teach a lesson in humility thereby. The legislature of the State of Tennessee has commanded that the teaching of evolution shall cease, believing in its ignorance that it can turn falseness into truth and folly into reason, not realizing that a higher Power even than itself, which it seeks to protect, needs no defence from such a tribunal.

The history of the Fifth Estate repeats itself, and a careful structure, built brick by brick of logic by inspired and intellectual workers, reaching nearer and nearer to the truth of things is assailed by the unreasoning battering ram of mob violence. It is unfortunate that a test of arms between ignorance and intellect should have reached the degree of absurdity attained by the Scopes trial in Dayton, Tennessee. The laws of science need no defense for they were laid down, before the time of man, by the same exalted Power whose dignity the Lilliputians are so jealous of. No evolutionist seeks to destroy the fortress of the Lord for he appreciates and reverences more truly the secrets of nature than does the prating multitude that worships a written code and sees God as the portrait of a man.

Each summer must have its popular song or its back to nature story; this year it is an interlude in a Midsummer Night's Dream.

## PRESCRIBING ALCOHOLIC LIQUORS

HERETOFORE physicians who have not complied with the legal restrictions imposed by the government in prescribing the various forms of alcoholic medicines have upon conviction been deprived of the license issued by the authorities.

It is now announced that physicians who prescribe liquor illegally will be prosecuted before the Federal Grand Juries. The penalties are as follows: For the first offense a five hundred dollar fine, for the second offense a one thousand dollar fine or ninety days in jail, and for a third offense an unlimited fine and two years' imprisonment. The government may in certain cases allege conspiracy which, if proven, will carry penitentiary sentences. Any collusion between a physician and another person for the purpose of securing liquors for other than medicinal purposes is held to be conspiracy.

Under this change of policy every physician who has a government permit should carefully study the terms of his license in order that he may not unwillingly lay himself open to prosecution. It seems to be evident that the government has reason to suspect that a proportion of doctors are not obeying the law.

It would be most unfortunate if it can be shown that any considerable number of physicians are aiding and abetting illegal distribution of alcoholic liquors.



### THE EPIDEMIC TOLL

THE recent epidemiological report of the League of Nations Secretariat seems to indicate a general improvement in health in the United States and most other countries for March and April, at least so far as epidemic diseases are concerned. The milder diseases such as measles and diphtheria have shown an increase, while the more severe ones such as smallpox and spinal meningitis are either decreasing or remaining stationary.

The figures for smallpox nevertheless remain such as to constitute a disgrace for any civilized countries. Thus in 27 states 3,412 cases were reported for the four weeks ending March 28, as against 4,232 cases during the previous four weeks, and 4,997 during the corresponding weeks of the previous year, indicating that the maximum incidence was reached two months earlier than in 1924. An outbreak of violent smallpox in Minneapolis lasting seven months seems to have ended; this consisted of 1,182 cases with 331 fatalities, a case mortality of 28 per cent.

There is less smallpox in Canada than during the early part of 1924, most of the cases now occurring in British Columbia. Mild smallpox continues to spread in England, and a more fatal type of the disease seems to be prevalent in Spain. Smallpox has increased markedly in India during the last two years.

Measles seems generally to have increased, and diphtheria is more prevalent in Western and Central Europe than in the early months of 1924. A considerable increase has been reported for England and Wales. Diphtheria continues to decrease in the United States, and the incidence of influenza is low except for an increase in Denmark and Sweden for March and April, although even in those countries the figures are lower than for previous years.

All epidemic diseases are known to occur in waves, and this general incidence is higher during the spring months. Such diseases as smallpox and diphtheria, however, for which we possess known and proven specific preventive measures, should, if these measures are properly employed, show a steady decline in their epidemiological importance.

### CONDITION OF MILK PRODUCTION

AN interesting series of experiments extending over five months has recently been conducted at the Central Experiment Farm in Ottawa, Canada, with the object of determining the effect of various factors in the contamination of milk.

These factors were divided into four classes—care of the stable, care of the animals, care of the utensils, and care taken by the milker. Many bacteriological tests were made of the milk of a large number of cows kept under as

nearly identical conditions as possible, with results which give valuable indications as to the importance of these factors in the contamination of the milk.

It is of interest to note that a high grade milk, relatively free from bacterial contamination, could be produced by the careful use of ordinary sanitary precautions without the employment of elaborate and expensive methods. The principal sources of infection were found to be represented by dirt and manure dropping into the pail during the milking, and by the use of improperly cleaned utensils. Contamination from the air was of much less importance.

The state of cleanliness of the milk-pail seemed to be of greater concern than its form, if the animals were properly cleaned. With unclean animals the small top pail resulted in a much smaller degree of contamination than did the open top pail, but with animals properly cleaned the difference between the two types of pail was almost negligible, a factor of much greater importance being the sanitary condition of the pail; indeed this factor was found to be of greater importance than any other connected with the milking.

### PETTY FEE SPLITTING

A CIRCULAR letter has recently been sent to physicians by the Gloucester Cod Liver Oil Company, recommending the product of that concern as being superior to most other oils of a similar nature on the market. There is nothing unusual about such an advertisement. Our desks are being constantly deluged by a flood of like literature from all possible sources. Cod liver oil is being recognized and perhaps overestimated as an efficient and valuable remedy in many of the acute and chronic diseases to which humanity is heir. There are good oils and there are poor oils, there are sweet oils and there are rancid oils, there are flavored oils and there are oils presumably so pure and bland that they require no disguise; there is no reason for doubting that the product under discussion is one of the better kind.

The paragraph in the circular letter issued by the Gloucester Cod Liver Oil Company which the JOURNAL deems worthy of comment reads, "For every pint of Cod Liver Oil ordered from the Gloucester Cod Liver Oil Company by your patients with your endorsement we will pay you twenty-five cents per bottle."

Any patient consulting any physician is correct in assuming that he is entitled to the honest and unbiased opinion of his physician; if he is referred to a consultant it is not because of an honorarium derived from the splitting of a fee; if a remedy is prescribed it is presumably selected without the persuasive influence of a twenty-five cent bonus per pint bottle.

The Gloucester Cod Liver Oil Company, no doubt with the best of intentions, fails to ap-

preciate that the relations between a physician and his patients call for a higher code of ethics than are popularly supposed to exist in purely business relations. This is the basis on which the splitting of fees is banned by the organizations to which we look for our moral leadership. No physician should be tempted to give other than a frank and honest opinion, formed according to the best of his ability.

Moral dishonesty enters into a fee-splitting agreement between physicians. Ignorance or a misconception of our peculiar ethical code is impossible for the offering of a bonus by a commercial firm, but disregard of his professional obligations must be responsible for its acceptance by the physician.

#### A FEW WORDS ABOUT AUTHORS

FOLLOWING a suggestion received from several readers, the JOURNAL will hereafter publish in the Editorial Section a brief statement about the authors of original articles appearing in the same issue. It is not the intention of the Editors to give a complete recital of an author's degrees and positions, but to publish enough information about him to give the readers of the JOURNAL an opportunity to judge how well he is qualified to write upon the subject of his article.

Further criticism of this plan will be welcome.

The following men have original articles in this issue of the JOURNAL:—

BETH VINCENT, A.B. Harvard '98; M.D. Harvard 1902; F. A. C. S.; Assistant Visiting Physician at the Massachusetts General Hospital.

JOSEPH H. PRATT, Ph.B. Yale; A. M. Harvard; M. D. Johns Hopkins 1898; Consulting Physician to the Brockton Hospital and the Memorial Hospital, Chelsea. An Internist of Boston.

BENJAMIN WHITE, Ph.D. Yale; Director of the Massachusetts Antitoxin & Vaccine Laboratory, Assistant Professor Bacteriology and Immunology Harvard Medical School and School of Public Health.

SANFORD B. HOOKER, A.B., Dartmouth 1909; Ch.B., Boston University 1912; M.D. Boston University 1913; A.M. University of California 1916; Associate Professor of Immunology Boston University School of Medicine; Head of Department of Immunology, Evans Memorial; Immunologist to Massachusetts Homeopathic Hospital.

LYMAN RICHARDS, M.D. Harvard 1886; American Academy of Ophthalmology and Otolaryngology, Surgeon in Otolaryngology, Children's Hospital, Boston; Associate in Otolaryngology, Brigham Hospital; Associate Staff, Deaconess Hospital; Bronchoscopist, Union and General Hospitals, Fall River.

HAROLD A. ROSENBAUM, Rush Medical College 1916; Fellow American College Physicians.

Practises Pediatrics in Chicago; Assistant attending Physician to the Children's Memorial Hospital, Chicago, Ill.; Medical Staff Elizabeth McCormick Memorial Fund; Membership in Central States Pediatric Society; American College of Physicians; American Medical Association.

ALMON PLINNEY GOFF, of Maywood, Illinois; M.D. University of Buffalo 1897; Surgeon (R.) U. S. P. H. Service; At U. S. Veterans' Hospital No. 76; Member A. P. H. Ass'n.

HERBERT JOSEPH CRONIN of Cambridge, Mass.; M.D. Harvard 1911.

FREDERICK S. HOPKINS of Springfield, Mass., A.B.; M.D. Harvard 1918; Assistant Surgeon Springfield Hospital, Assistant Surgeon B. & A. Railroad.

#### The Massachusetts Medical Society

##### CHANGES OF MEMBERSHIP IN DISTRICT SOCIETIES

Burisch, John L., from 81 to 86A Pleasant St., Worcester.

Chambers, Ralph M., from Medford (Middlesex South) to Taunton (Bristol North), Taunton State Hospital.

Devine, William H., from South Boston (Suffolk) to Milton (Norfolk), cor. Brook and Brandon Rds.

Doroff, Louis A., announces the removal of his office to 9 Crescent Ave., Chelsea; telephone Chelsea 0940.

Jensen, William C., Olean, N. Y., now 120 South Ninth St.

Laub-Gross, Victor F. H., from Boston (Suffolk) to (Non-Resident List) Brooklyn, N. Y., 303 Hopkinson Ave.

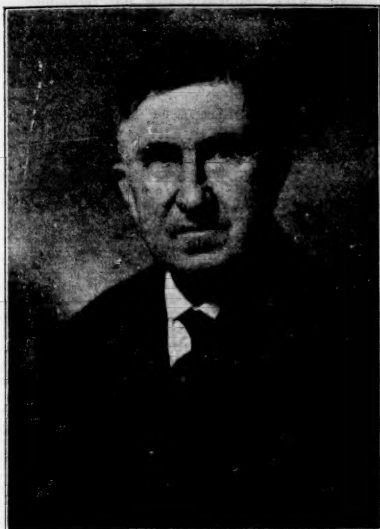
Myers, Samuel W., Boston, 34 McLean St., has had his name changed to Myerson by the Legislature. Sharp, Benjamin S., from Iowa City, Ia., to Providence, R. I., 30 Bellevue Ave.

Stuart, Harold C., from Boston (Suffolk) to Brookline (Norfolk), office Boston, 270 Commonwealth Ave.

#### MISCELLANY

##### SOUTH CAROLINA HAS EFFECTIVE SYSTEM OF DISEASE REPORTING

DR. JAMES A. HAYNE, State Health Officer of South Carolina and Collaborating Epidemiologist of the United States Public Health Service, has instituted a new and decidedly more effective system of disease reporting by physicians. Each week a card is mailed to physicians for the report of the number of cases of diphtheria, gonorrhea, syphilis, malaria, smallpox, tuberculosis, and certain other diseases. The greater effectiveness of this system of reporting is shown by the fact that in the first month of its operation 734 cases of syphilis were reported as against an average of 245 cases for each of the preceding ten months, or three times as many cases as were reported formerly. There is a still higher rate of increase in the number of reported cases of gonorrhea. Over seven times as many cases of this disease were reported under the new system as were reported formerly.—*United States Public Health Service.*



JOSEPH D. PHILLIPS

THE PRESIDENT OF THE MAINE MEDICAL ASSOCIATION, SOUTHWEST HARBOR

Dr. Phillips was born in 1857 and graduated in medicine from the New York University Medical College in 1886.

#### THE PROPORTION OF PHYSICIANS TO THE POPULATION IN AUSTRALIA

A CENSUS of the doctors in Australia for the present year gives the number as four thousand seven hundred and seventy-three or about one doctor to about one thousand two hundred and twenty-three. As in most other countries the proportion varies according to the density of population. In Queensland there is only one doctor to sixteen hundred and sixty-four people.

There is a gradual diminution of the number of patients to each medical practitioner.

There has been an increase in the number of doctors from 1924 to 1925 of about six per cent.

#### PREVENTABLE DEAFNESS

A RECENT editorial in the *Washington Times* says that "There are many cases of deafness from birth or early infancy, some due to microbes that attack the new born child. Twenty-five per cent of such attacks come from heredity, venereal blood disease—one of the worst enemies of the human race and one of the most dreadful punishments of vice."

Deafness of such origin may be total or par-

tial, and it is usually an affliction of the internal ear. The defect is often not recognized until the child fails to talk, the attack of syphilis being unexpected and somewhat elusive. Syphilitic deafness, says the United States Public Health Service, need not be profound, but its gradual or sudden effect on the hearing capacity of the afflicted child often spells economic and social disaster, and it usually reduces life to an obscure and baffling existence. Fortunately, considerable progress has been made in the treatment of deafness of venereal origin, and the future promises still greater progress in its elimination. The early detection of diseased blood in the expectant mother is essential, so that the possible ear damage of the child may be prevented by adequate treatment of the mother before the birth of the child. The preparation and widespread dissemination of information relating to the prevalence, the detection and the prevention of venereal diseases is a most essential and productive health measure.

#### EXCERPTS FROM THE REPORT SUBMITTED TO PARLIAMENTARY MEDICAL COMMITTEE ON THE SPAHLINGER TREATMENT\*

A SPECIAL meeting of the Parliamentary Medical Committee, on Thursday, July 2nd, received a report from five members of its committee who, though not as representatives of the committee, had visited Geneva between June 19th and 25th to investigate the Spahlinger method of treatment for tuberculosis. The report, which was a full one, was discussed at length by the Medical Committee, and several members who had previously investigated the Spahlinger system compared the party's experiences with their own. The committee had prepared recommendations, but in view of the fact that M. Spahlinger was expected in London at an early date for a conference, these recommendations were not pressed, and it was decided not to publish them at present.

The report to the committee was signed by Dr. Watts, Dr. Salter, Dr. Vernon Davies, Dr. Drummond Shields, and Dr. J. H. Williams. They stated that one of their number had special experience in the conduct of a bacteriological laboratory, and several had years of clinical experience with large numbers of tuberculosis cases. They stated that all questions put to M. Spahlinger and his fellow workers had been answered without reserve, and that experimental and clinical records were placed at their disposal. Each of the party examined about fifty patients who had suffered or were suffering from tuberculosis and had been or were being treated by M. Spahlinger's methods. The party found M. Spahlinger to be a highly skilled bacteriologist, with great knowledge of electrical

\*The British Medical Journal, July 11, 1925.

and physio-chemical apparatus. They were satisfied that he was not actuated by personal or selfish motives, and had refused to allow his discoveries to be commercialized. The equipment of the Spahlinger laboratories was as good as the party had seen at any university.

Up to the present about 600 cases were known to have been dealt with by M. Spahlinger, and at least 250 could be traced and examined. A number were Russian prisoners of war who were detained in Switzerland and had disappeared.

The party reported that they had examined about 50 patients, some cured and well, some partially cured and in process of recovery, and some who were just commencing treatment. Amongst the latter were several of the gravest severity, which by no means of treatment at present known to science could be expected to recover. The clinical records of certain cases showed that persons who now appeared perfectly fit and well were originally suffering from an advanced stage of consumption. When the party saw them the only evidence of their original condition detectable was some patchy dullness indicating where the lungs were healed by fibrosis. There were no moist or adventitious sounds of any kind, and the temperature was normal. The sputum, examined and reported upon by independent medical observers attached to hospitals, etc., was negative. Some of these people were following unhealthy occupations in a very bad environment, yet remained well. Scarcely any of the patients had been treated by Spahlinger's remedies under suitable hospital or sanatorium conditions. Many of them remained at work though their temperature was well above normal. Cases of healed surgical tuberculosis were also shown, though the pulmonary cases were the more striking. A number of cases had been treated from eight to twelve years ago, and had remained well without relapses during that time.

The party came to the conclusion that on the evidence presented a *prima facie* case had been made out for the Spahlinger treatment. They recommended that an exhaustive trial should be made under test conditions as soon as it was possible to obtain a sufficient quantity of the serum and of the vaccines.

## CORRESPONDENCE

### The Massachusetts Medical Society

#### RESIGNATIONS FROM THE MASSACHUSETTS MEDICAL SOCIETY

July 20, 1925.

Editor, Boston Medical and Surgical Journal:

In reply to your letter of July 17, received today, there is no doubt but that the By-Laws of the Society are explicit that no one can leave the Society except by death or by action of the Council. The Committee on Membership and Finance recommends action to the Council but has no power of its own to accept or refuse resignations. In case a Fellow is in arrears

this committee frequently does not recommend accepting a resignation; then he is deprived, later, for non-payment, under the terms of Chapter I, Section 3.

Sincerely yours,  
W. L. BURRAGE, Secretary.

#### MIDDLESEX COLLEGE OF MEDICINE AND SURGERY

85 Otis Street  
Cambridge 41, Massachusetts

July 14, 1925.

To the Editor,  
BOSTON MEDICAL AND SURGICAL JOURNAL,  
126 Massachusetts Avenue,  
Boston, Mass.

Dear Sir:

The report of the proceedings of the Council of the Massachusetts Medical Society in the July 2nd issue of the JOURNAL is so unfair to the Middlesex College of Medicine and Surgery and so divorced from the truth that I trust you will not deny me the privilege of presenting our side of the subject to your readers.

That the students of the Middlesex College sent copies of their magazine, *The Caduceus*, to the legislators is, I believe, true, but it is not true that the faculty approved this action or helped finance the magazine.

Dr. Painter, no doubt, meant Middlesex College when he said "they employ a paid lobbyist," and "money is spent freely by the schools who oppose our legislative efforts." Neither of these statements is true in so far as Middlesex College is concerned.

Since the requirements of this school for admission are a high school education and two years of pre-medical college work; and the course covers four years of nine months each, and in addition a year of hospital internship before the conferring of the degree; it cannot with fairness be maintained that the faculty considered that Middlesex College would be injured by the passage of the legislation proposed last year.

Making allowances for Dr. Painter's chagrin at last year's legislative debacle, which he so aptly styles an "ignominious failure," one still finds a persistent note of animosity throughout his report that is not consistent with his position either as a physician or as an officer of the society.

The "debacle" and "ignominious failure" was due to the dishonest dealing in half truths that characterized the drafting of a lengthy, complex, and far-reaching bill, which, instead of deceiving the legislators, opened their eyes to the fact that the Massachusetts Medical Society had descended from its high position of public service to attack a small school whose chief fault lay in its resistance to the domination of the American Medical Association.

On page 7 in the report of the Committee on Ethics and Discipline, Dr. Henry Jackson, in speaking of Dr. Painter's failure to investigate Middlesex College, did not add that the college opened the way for an examination by an impartial board. The provisions he enumerated, which caused Dr. Burrage to return unopened the envelope containing the names of our faculty, reveal the real motives influencing those who formulated the policies of the Massachusetts Medical Society and attempted to carry them out.

Yours very truly,

JOHN F. CONEA, JR., PH.G., M.D.,  
Secretary.

#### DR. PAINTER'S REPLY

The letter appearing in this issue of the JOURNAL, signed by the Secretary of the Middlesex Medical School, is in the same spirit that all previous com-



munications from that source have been. The Massachusetts Medical Society is not now, and never has been, directing its efforts toward the suppression of any "small school." Other things being equal, the smaller it is the better it is. What we are interested in is the elevation of the standards up to which graduates from any school must come who are intending to practice in this State. This involves modifying our State registration law so that this Commonwealth is not obliged to accept as candidates before its Board of Registration in Medicine anyone whose diploma does not guarantee a proper and sufficient medical and general education. Having taken this perfectly tenable position it logically followed that no member of this Society ought to be on the Board of Instruction or Faculty of any school, the graduates of which the Society felt should not be allowed to come up for registration. There being schools in this State, operating under charter from this State, the behavior of whose graduates before our Board of Registration (for they are not acceptable for examination before but few, if any, other State Boards of Registration in Medicine) was such as to justify the suspicion that something was wrong in the preparation that was accorded them. To justify any action the Society might see fit to take it was only fairness that prompted an investigation of these schools. Permission for such investigation was refused. For those who are not members of the Council and therefore had no opportunity to hear the correspondence in reference to this matter, I will simply say that it was not until a Registered letter was sent, with request for return receipt, that any attention at all was paid to the requests for opportunity to inspect the Middlesex School. After much evasion, all of which is on record in the correspondence above referred to, it was finally suggested by the Middlesex authorities that they would be willing to be investigated by a committee upon which there should be no one who was a member either of the American Medical Association or the Massachusetts Medical Society. One such person was to be named by the Middlesex School, one by the Massachusetts Medical Society, and these two should choose a third. They were to have been Doctors. We held to the belief that there was certainly as good a chance to find an honest, competent and unbiased man among the forty-five hundred members of the Massachusetts Medical Society who are registered practitioners in this State as among the one thousand other registered practitioners, many of whom are irregulars of one sort or another and ineligible because not graduates from medical school, for I would remind you that this Commonwealth has only insisted for ten years upon a degree in medicine as a prerequisite for registration. The Attorney-General's office was asked to conduct and did conduct an investigation upon which no return has as yet been made, so far as I am able to ascertain. It is safe to say had it been made and was favorable *The Caduceus*, at least, would have made capital of it.

If anyone believes that a competent as well as an impartial investigating committee could be selected from such material and in such a way he is of course entitled to that opinion.

In the report of the Committee on Medical Education, to which this communication refers, it was freely admitted that it was the complexity of the bill that defeated it. Senate Bill No. 19, however, was drafted by non-medical members of the Legislature, without consultation with the medical profession except in the public hearings, so far as I know. The two features in it in which the Massachusetts Medical Society was interested were Appendices B and C. Both of these were features of a bill introduced by the Committee on Medical Education of this Society in 1924 and opposed by the Middlesex School at the hearings of that session of the Legislature. If such proposals were not unfavorable to the Middlesex Col-

lege in 1925, as it is claimed in this communication that they were not, they certainly could not have been in 1924 when it opposed them. A published statement of the courses of instruction showing the subjects taught, the time spent and a roster of the instructors, is what one might fairly expect to be provided with as furnishing some basis for judgment upon the statement made in the fourth paragraph of the above letter. We were informed that no catalogue was published and we were sent what purported to be a roster of the faculty, sealed and not to be opened unless we were prepared to say that no injury should come to any name contained therein if we availed ourselves of the opportunity to open it. It was very properly returned unopened.

In regard to the statement in the second paragraph, I am content to leave what was written in the report just as it stands, believing that it has been strengthened by the admission that *The Caduceus* was distributed among the legislators as well as everywhere else where it was thought it might discredit the seekers for better registration laws in Massachusetts. If the Faculty did not approve they certainly have been very reticent about revealing their real sentiments until now. As to where the money comes from and how it is procured—for financing a student publication of which the Faculty disapproves—that will necessarily have to be left to the imagination. One with some experience could recognize a Jackass even when his ears were covered up.

CHARLES F. PAINTER, M.D.,

Chairman, Committee on Medical Education  
and Medical Diplomas.

#### CANADIAN LETTER

(From an Occasional Correspondent)

Montreal, July 12, 1925.

##### PREVENTION OF DISEASE IN CANADA

The slogan of medicine in Canada, as in other civilized countries, appears to be in the direction of prevention of disease. At the recent meeting of the Canadian Medical Association in Regina this subject of medicine seemed to be the dominating one.

The first aim of preventive medicine must be to save infant and child life and to rear infants and children in a healthy way. This is the only method by which a healthy race can be raised, and in view of the decrease in the birth rate, a means for increasing the population.

It was announced the other day from Ottawa that the birth rate continues to decline in English-speaking Canada. Statistics for the month of January covering the Dominion Bureau of Statistics registration, which does not include Quebec, show that in January, 1925, 11,888 living infants—6,119 males and 5,764 females—were born, as compared with 12,833 in January, 1924, 12,946 in January, 1923, and 14,236 in January, 1922. The equivalent annual birth rate for 1,000 population for last January was 20.05. In January, 1922, it was 25.6. Mortality among children under one year of age continues to decrease. In January, 1925, the rate per 1,000 living births was 81.04, compared with 107.2 in January, 1923, the worst month in the past five years. Canada's death rate amongst people of all ages also is on the decrease. In January, 1925, there were 5,656 deaths in the eight provinces of the registration area. This was an equivalent of 9.5 per 1,000 of population, as compared with 10.6 in January, 1924, and 11.5 in January, 1923. Amongst the specific causes of death, heart disease claimed the most. Pneumonia was the second most frequent cause, cancer the third, diseases of the arteries fourth, and pulmonary tuberculosis fifth.

##### HOSPITAL ACCOMMODATION LACKING IN MONTREAL

According to Major A. K. Haywood, superintendent of the Montreal General Hospital, Montreal needs at

least 1,500 beds more in hospital accommodation. A city with adequate facilities should have from 5 to 7 beds per 1,000 population, whereas Montreal has only 3.5 per 1,000. The reasons that hospitals here cannot build additional room for beds at the present time is not so much a question of capital expenditure as that of securing funds necessary to maintain the beds afterwards. Every public ward bed means a loss to the hospital. With the present large deficits facing the boards of management, they cannot consider the addition of more beds until assurance is given as to the financing of them. During 1924 the hospital accommodation of Montreal has been largely increased, but is still quite inadequate to meet the needs. A meeting was held in Montreal a few nights ago, in which it was argued that the Jews should have a hospital. Dr. Viner, president of the Montreal Clinical Society, speaking of the need for a Jewish hospital, said that there were many reasons why a Jew should be able to have treatment in an institution for his own race. There were English Protestant hospitals, French Catholic hospitals, and he thought there should be a Jewish hospital. The hospital would not be for Jews entirely but would be under Jewish control and have a staff chiefly Jewish. In particular there was the need for correct diet to be given to those Jews who observed the strict dietary rules of their religion. Hungarians, Swedes and Italians had need of their own cooking, and so did Jews. And it was never more necessary for a man to diet in his own particular way than when he was ill. Another advantage of having a Jewish hospital would be that it would give their graduates a better opportunity of doing practical work. Another speaker pointed out that there were between 60,000 and 70,000 Jews in Montreal. Dr. A. Bercovitch, secretary of the organizing committee, announced that the doctors interested in the project had promised \$20,000 towards its cost. The erection of the proposed hospital would cost \$500,000 and would accommodate 150 beds. A resolution was moved and carried unanimously, urging that, owing to the present inadequacy of hospital accommodation in Montreal and of the need for a Jewish hospital, there should be carried out, in connection with the committee of the Hebrew Maternity Hospital, plans for the erection of a large general hospital which would be for the use of all races and creeds and which would have a maternity section.

#### ALTERATION IN METHODS OF HANDLING INSANE IN THE PROVINCE OF QUEBEC

Dr. Desloges of Montreal, Superintendent of Asylums in the Province of Quebec, has just announced that a radical change will be made in the handling of insane persons, the result of which is expected to allow curable insanity to be dealt with more successfully, and the classification of insane people facilitated. The method to be brought into use has been employed in certain parts of the United States and Great Britain for some little time. Instead of confining insane persons or persons alleged to be insane immediately in institutions where the newcomers come directly in contact with advanced cases, in future all patients will first be brought to a special hospital separated entirely from the asylum, where their cases will be studied for some time until they can be released as cured; or, being found of a type which is not curable, or in need of a long treatment, or perhaps permanent incarceration, transferred to the institutions in which insane people are at present confined.

The first move in this direction will be made at a new hospital now being built at Beauport, which is to be known as the Quebec Psychiatric Hospital. The institution, the building of which is already in progress, will have accommodation for 250 patients.

#### SPÄHLINGER SERUM FOR ONTARIO

The Ontario Department of Health is to have one of the first consignments of the Spählinger serum for tuberculosis to be sent out from the laboratories in Geneva. This is due to the action of Dr. Godfrey, Minister of Labor and Health in Ontario. Dr. Godfrey, who has recently returned from Europe, is confident that the serum will produce splendid results. When Dr. Godfrey was in Geneva, M. Spählinger showed him the experimental animals, and if, as he, Dr. Godfrey, believes, he has a partial bovine vaccine which will immunize cattle herds, it will be readily seen what it may mean in the prevention of animal tuberculosis.

#### INCREASE OF ACCIDENTS IN THE PROVINCE OF QUEBEC

In the official road bulletin of the Province of Quebec the Hon. J. L. Perron has an article in which he says that last year in the Province automobile accidents were responsible for 139 deaths. The total for 1923 was 117. This shows an increase of 19 per cent. over 1923. The writer goes on to say that numerous and varied are the occasions of accidents. Modern danger signs are placed on all the highways; curves are straightened and sharp turns and level crossings eliminated as far as possible. This lessens the danger and reduces the number of accidents, but does not strike at their causes or constitute a remedy. In the opinion of Mr. Perron, both causes and remedy are in the hands of the public. He goes on to point out that there are accidents no one can foresee or prevent; others are caused by imprudence, of which contempt of traffic rules is the most frequent. Out of 100 accidents, in his opinion, 65 are due to excessive speed, 25 to abuse of intoxicating liquors, with reckless driving as a consequence, and 10 at the most to ill luck! This means that 90 per cent. of all accidents could be avoided by the exercise of elementary prudence.

#### MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

##### DISEASES REPORTED FOR THE WEEK ENDING JULY 18, 1925

Anterior poliomyelitis	2	Pellagra	1
Chickenpox	58	Pneumonia, lobar	35
Diphtheria	52	Scarlet fever	49
Dog-bite requiring anti-rabic treatment	1	Scalp sore throat	1
Encephalitis lethargica	8	Syphilis	36
Epidemic cerebrospinal meningitis	3	Suppurative conjunctivitis	12
German measles	31	Tetanus	1
Gonorrhea	119	Trachoma	1
Hookworm	1	Tuberculosis, pulmonary	123
Measles	276	Tuberculosis, other forms	18
Mumps	19	Tuberculosis, hilum	2
Ophthalmia neonatorum	17	Typhoid fever	27
		Whooping cough	142

#### RHODE ISLAND STATE BOARD OF HEALTH

##### CONTAGIOUS DISEASES REPORTED FOR THE WEEK ENDING JULY 11, 1925

Diphtheria	5	Poliomyelitis	2
Measles	19	Typhoid fever	2
Smallpox	4	Chickenpox	1
German measles	1	Whooping cough	3
Scarlet fever	5		

CONNECTICUT DEPARTMENT OF HEALTH  
MORBIDITY REPORT FOR THE WEEK ENDING  
JULY 18, 1925

Diphtheria	25	Encephalitis epid.	2
Last week	17	German measles	4
Diphtheria bacilli carriers	3	Malaria	2
Scarlet fever	21	Mumps	5
Last week	14	Pneumonia (broncho)	6
Whooping cough	106	Pneumonia (lobar)	9
Last week	102	Poliomyelitis	1
Measles	58	Tetanus	1
Last week	86	Tuberculosis (pul.)	39
Typhoid fever	4	Tuberculosis (other forms)	8
Last week	3	Gonorrhea	39
Cerebrospinal men.	2	Syphilis	26
Chickenpox	14		

NEWS ITEMS

THE APPOINTMENT OF DR. HENRY L. HOUGHTON—The Governor nominated and the Council confirmed the nomination of Dr. Henry L. Houghton to membership on the Board of Registration in Medicine. Dr. Houghton has previously served in this capacity.

THE FREDERICK K. STEARNS MEMORIAL FELLOWSHIP IN MEDICINE AT THE UNIVERSITY OF MICHIGAN—Frederick Stearns & Co. have founded at the University of Michigan the Frederick Kimball Stearns Memorial Fellowship in Medicine, in honor of the late Frederick Kimball Stearns.

Mr. Stearns was a life-long patron of the arts and sciences, and had shown a special interest in the progress of the University of Michigan. The Stearns Botanical Gardens, the Stearns Fellowship in Pharmacy and the Stearns Collection of Musical Instruments, the most complete collection of its kind in the world, were evidences of his interest and generosity.

While the medical fellowship is to be used at the direction of the university medical authorities, the work during the coming year will be devoted to researches on insulin and insulin therapy.

REPORTS AND NOTICES OF MEETINGS\*

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

REGULAR Quarterly Meeting was held Tuesday, July 28th, 1925, at Gardner State Colony.

Members and Their ladies invited. Luncheon at 1 P. M. Scientific program submitted by the Colony staff. Ladies were invited to inspect the Arts and Crafts.

\*Notices of meetings must reach the JOURNAL office on the Friday preceding the date of issue in which they are to appear.

SOCIETY MEETINGS

NEW ENGLAND STATE MEDICAL SOCIETIES

The annual meetings of the New England State Medical Societies are scheduled as follows:  
Vermont State Medical Society—St. Johnsbury, Oct. 15-16, 1925.

BOOK REVIEWS

*The Surgical Clinics of North America.* New York Number—April 1925. Volume V, Number 11, 337 pages with 105 illustrations.

tions. Published by W. B. Saunders Co., Philadelphia.

This volume follows out the usual procedure in previous volumes, that of reporting the clinics of its various contributors. The following clinics are contained in this number: Dr. Eugene H. Pool, New York Hospital, Dr. John F. Erdman, New York Postgraduate Hospital, Dr. Charles G. Heyd, New York Postgraduate Medical School and Hospital, Dr. Willy Meyer, Lenox Hill Hospital, Dr. Fred H. Albree, New York Postgraduate Hospital, Dr. Byron Stooky, Neurological Institute, Dr. De Witt Stetten, Lenox Hill Hospital, Dr. Carl Eggers, Lenox Hill Hospital, Dr. Sidney Yankauer, Mt. Sinai Hospital, Dr. Geo. G. Ward, the Woman's Hospital, Clinic at the Presbyterian Hospital and Clinic of Dr. Chas. E. Farr and Margaret Fries, Surgical Dept. of Cornell Medical School.

Among the important subjects treated are the following: Blood transfusion by the direct method; Diseases of the Spleen, Hyperthyroidism, Diagnosis and Treatment of Cholecystitis, Thrombo-Angitis Obliterans, Surgical treatment of pulmonary tuberculosis, four extramedullary Tumors of the spinal cord, with removal, Cholecystectomy without drainage with special reference to the covering of the cystic duct stump with a peritoneal flap, Acute Empyema, Hemorrhage from gastric and duodenal ulcers.

These articles are all brief but of considerable value.

*Pediatrics.* Edited by ISAAC A. ABT, M.D., Professor of Pediatrics, Northwestern University Medical School, Attending Physician Michael Reese Hospital, with the collaboration of Johanna Henmann, M.D., Volume IV of the Practical Medicine Series The Year Book Publishers. Chicago. 1924 Series.

This volume of over 350 pages is composed of abstracts of all the important pediatric literature of the past year, exceedingly inclusive, well selected and admirably classified and indexed. In all 415 authors are abstracted. Such a book, appearing at an interval after the publication of this article abstracted is of great value, its value depending in large part on the care with which it has been prepared and edited. In this instance the editor's notes alone attest the thought which has been given to its preparation.

An annual volume of this nature should be invaluable to the pediatrician.

*Clinical Medicine For Nurses.* By PAUL H. RINGER, A.B., M.D. F. A. Davis Company, Philadelphia, Pennsylvania, 1924. Second Edition Revised. Price \$2.50.

The substance of this book consists of the medical lectures which the author has given

for several years at the Asheville Mission Hospital, Asheville, N. C.

It endeavors to give the fundamental facts of medical diseases and, therefore, is very helpful to student nurses. The chapters are short and well organized. They include an anatomical review of the structures discussed and the pathology is briefly explained. The book carries out its stated aim, namely to interpret to the student nurse the meaning of symptoms and the presence of complications.

Many changes have been made in the revised edition to bring the book up to date, among which is included the treatment for Diabetes Mellitus, Heart Failure and Influenza.

The entire arrangement makes it an excellent book to be used by the nurse-instructors and the busy head nurse who are attempting to do individual teaching at the bedside.

*"Internal Secretion and the Ductless Glands."*

By SWALE VINCENT, LL.D., D.Sc., M. D., etc., Professor of Physiology in the University of London. Illustrated. Third Edition. New York, Physicians and Surgeons Book Company. 1925.

This book is best described as a historical account and a critical review of the subject of internal secretions, principally from the viewpoint of experimental physiology, but also with attention to what is established or probable and to what is improbable and fantastic in the bases for clinical application. Its 463 pages are for the most part occupied by concise statements of the great volume of experimental work through which our knowledge of internal secretions had its beginnings and has since developed. Through study of these pages a reader who is willing to apply himself closely will be able to make a general survey of what is definitely known to physiology.

Those clinicians, on the other hand, who are anxious to find encouragement in unestablished forms of organotherapy will find in this book little to spur their enthusiasm. The general attitude of the author seems at times over cautious, especially in dealing with matters which cannot be tested in the laboratory. The impression arises that in touching upon clinical matters he feels that he is on unfamiliar ground, and that the clinical statements are introduced somewhat artificially in what is otherwise a purely physiologic discussion.

There is a short outline of the clinical tests and of the diet in diabetes in connection with the use of insulin. Otherwise the specific clinical applications are collected in a chapter on Organotherapy which occupies only 12 pages, and fails to give prominence to the separate measures which are of the greatest clinical service. Thus the use of adrenalin in asthma is mentioned only cursorily and hesitantly in a few sentences. Its use in anaphylaxis and in uterine

has been looked for in vain. Its local use in hay fever and in hemorrhage is mentioned favorably without reference to the clinical opinion that there is objection in the later reactions to such treatment.

This, following upon a warning against the *post hoc* and *propter hoc* reasoning of the clinician, calls up the contrary thought of how much would be lost to clinical medicine if all empiric clinical evidence were discarded.

This book, therefore, is not to be taken as a textbook of practical therapeutics although it can be recommended as an admirable statement of the physiological knowledge upon which, largely, with such corrections and additions as are to come, the future of internal secretions in medicine will be based.

*The International Medical Annual.* 1925—43rd Year. William Wood and Company. New York.

This compact volume of 548 pages follows out the general plan of the preceding successive volumes. There are 28 contributors, representing the United States and England. There are 33 plates, many of which are beautifully colored and valuable illustrations. There are in addition 87 other illustrations.

The introduction by the editors is intended to furnish the practitioner with the *creme de la creme* of the medical literature of the year. As the editors state, this introduction attempts to set out, in the smallest possible compass, just those advances which seem most likely to become part of the permanent equipment of the medical profession, and which every family doctor must by all means know.

The remainder of the book is really a dictionary of practical medicine, by many authors, and the subjects are treated in alphabetical order and not by subject. The articles are short and concise and aim to bring each subject well up to date. An adequate bibliography is appended.

This volume follows out the well known excellence of previous editions.

*"Practical Medicine Series Year Book."* "Gynecology." By THOMAS F. WATKINS. "Obstetrics." By JOSEPH B. DELEE. Volume V. Series 1924.

Again we welcome this volume with its compact abstracts of the progress the past year in Gynecology and Obstetrics. The vast amount of work entailed in the compilation of the book is very evident. The telling editorial remarks from both editors add much to the abstracts and it is to be hoped that the writers of the various articles commented upon will see them and thereby profit. For the busy practitioners the book is as in the past years of the greatest value to keep abreast of the times.